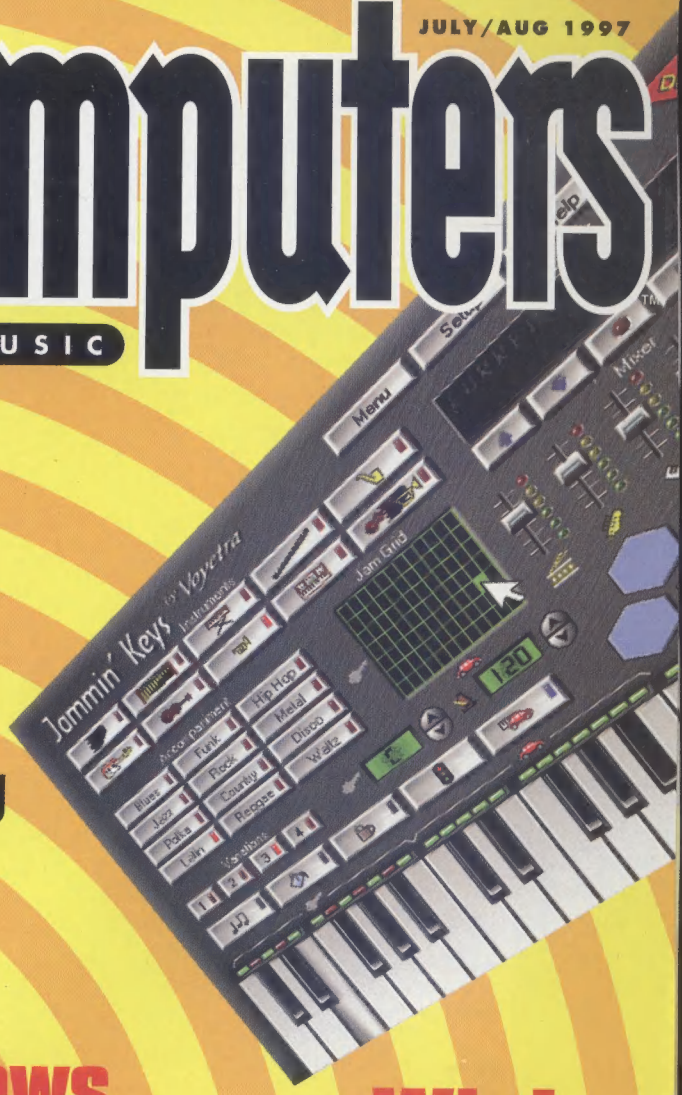
JULY/AUG 1997

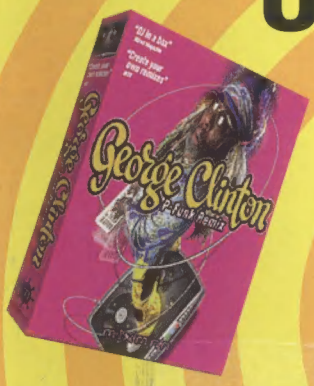
Music & Computers

THE MAGAZINE FOR DESKTOP MUSIC

Fun!

16 Music-Making Programs Under $100



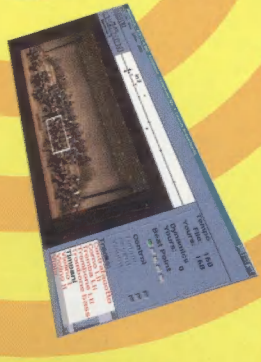


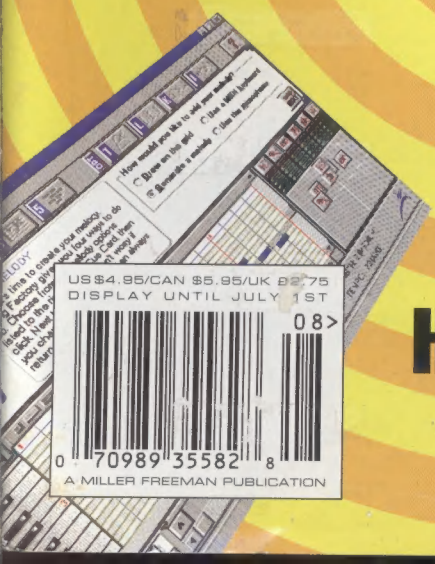
In-Depth Reviews

Emagic Logic Audio
BIAS Peak
Band-in-a-Box 7.0

Win!

A Home Studio Setup





How To Buy The RIGHT Soundcard

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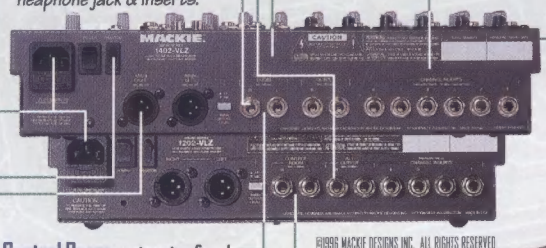

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[1] except RCA tape jacks, headphone jack & inserts.

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READER SERVICE NO. 101

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Music & Computers™
JULY/AUGUST 1997

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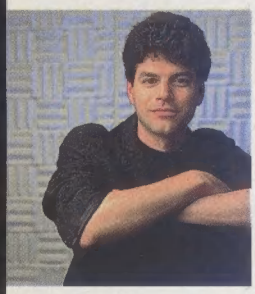
COLUMNS

From the Editor



Look for this icon throughout the issue. It tells you there's related information on our Web site.

Hey — thanks!

We just got the results of our first official reader survey and found that 91% of you save your copies of *M&C* for reference. In fact, the biggest complaint was that the magazine doesn't come out often enough.

We're working on that. In the meantime, we've increased the amount of online material that accompanies each issue. (After all, 68% of you access the Web regularly.) For example, the Band-in-a-Box review (page 59) links to an advanced tutorial on that program, the Peak review (page 53) is complemented by audio examples, and the printed Logic Audio review (page 39) is only about half as long as the Web-enhanced version.

The Logic review is also noteworthy because it takes a tutorial approach, explaining background concepts at length in the sidebars. In effect, we used Logic as a road map to the entire field of MIDI/digital audio sequencers (the type of software you're most interested in, according to our survey). Typically, when people read reviews, they'll scan the first paragraph, then jump to the conclusions. We wanted to offer something more.

Now what the heck is *fun* music software? Isn't music fun already?

Not often enough.

Many people feel embarrassed to play an instrument in front of others, or to try to learn a new instrument, or even to sing. This feeling extends to professional musicians as well. For instance, *M&C* columnist the Fat Man — whose music has sold more copies than Madonna has sold records — recalls the time he first played *The 7th Guest*. There's a puzzle in which you're faced with a piano and have to pick out the notes that make up the game's main theme. After spending a year hammering out that melody, thinking it might be the most listened-to piece he'd ever written, the Fat Man found he couldn't play it! He was frozen with the same feeling of dread he had felt the night before his piano proficiency exam in college.

Although Mr. Fat is a pretty happening guitarist, he confessed, "I was always insecure about the fact that I can't play keyboards at all, and I had a creeping suspicion that this would harm my success as a musician. But suddenly during that game, something clicked, and that was my last moment of keyboard stress. I realized that *The 7th Guest* was just a fun, invigorating product, and that even though I'm a crummy keyboard player, I can still have success in composing, thanks in some way to computers."

So what's up with this musical anxiety? Perhaps another anecdote will help explain. Not long ago, Jerry Garcia won a "Best Guitarist" award from *BAM* magazine and replied, "Well, thanks very much, but I never thought of music as a competition."

Or as *M&C* columnist Eric Bell told me recently, the reason he likes *M&C* is that other music technology magazines seem to be about *work*, while desktop music is about the excitement of discovery and creation. In that spirit, we've rounded up 16 fun music programs, searching for ones that provide both instant musical gratification and capabilities that are inspiring enough to jump-start your creativity. (See page 18.) No need to feel shy; go out and make some noise.

—David Battino

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READER SERVICE NO. 102

Fool Your Friends

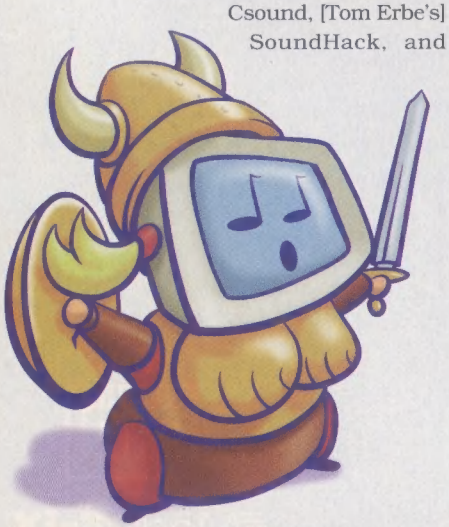
I just wanted to say thank you, and here is why: I'm a MIDI composer who does a lot of orchestration on my computer using the sounds in my synth module, a Korg O1R/W. I was having trouble making my orchestrations (which involved brass, strings, harp, piano, woodwinds, timpani, etc.) sound realistic. As if you had read my mind, you guys published "Get Real: Making Your MIDI Files Come Alive!" in the Nov/Dec '96 issue. That article has helped me inexplicably. I can proudly play my MIDI files now without saying, "The brass was supposed to *sforzando* there. . . ." With enough digital reverb, I've actually convinced people that they are real orchestral recordings!

One suggestion though — the article doesn't mention dynamic changes in tempo. That is an extremely effective technique I found in adding realism. I use Cakewalk's Draw Tempo option to create extremely emotional passages.

Glen Rhodes
via Internet

The Net Lady Sings

I wrote an opera exhibited over the Internet titled *Arbitrary Lives*. It can be found at arbitrary.hampshire.edu. It utilizes Csound, [Tom Erbe's] SoundHack, and [Macromedia] SoundEdit 16. Hope you check it out.



Jonathan Land
via Internet

What Next, Rebates?

How about putting the whole issue online when you sell out the printing (*e.g.*, your first two issues)? Since you won't reprint them, you won't be losing any money. Plus you will provide good examples of what the total magazine is like.

Franz Hespenheide
(a two-finger composer)
Gaithersburg, MD
via Internet

I just bought my first issue of your magazine (Mar/Apr '97), and I was thrilled to see the article on how to make a CD at home. The only problem is that now I'd like to see the rest of the series. I was hoping that you would have the back issues on your Internet site. Would you please e-mail me the first three installments of that article?

Roland Frasier
via Internet

Roland — Glad you liked the story. We don't e-mail copies of articles, but those three issues (Sept/Oct '96, Nov/Dec '96, and Jan/Feb '97) are still available through our back issues department. Just write to orders@mfi.com or call 800-444-4881 to order copies; the cost is $9 including shipping. We plan to create a reference area on our Web site with an archive of selected articles, but uploading entire issues is not feasible.

Digital Analogies

I would be really interested in seeing a head-to-head comparison between products like the Digital Audio Labs V8, Antex StudioCard, and the Metalithic Systems Digital Wings for Audio systems in an upcoming issue.

I think this is a really important aspect of any publication that deals with a specific area of technology. It would be nice to look at one source and have an idea of what to buy in the realm of professional computer-based audio. As of right now, all I can do is compare the ads.

Tim Gaichas
via Internet

Tim — Keep your eyes peeled for the Keyboard/Music & Computers Music Technology Buyer's Guide *(on sale September 20th). Can't wait?* Keyboard *— our sister magazine — compared ten high-end digital audio interfaces in its March and April '97 issues.*

Chop the Slop

It was quite pleasant to see that you apparently read the reader surveys. I asked for more how-to articles and, *voilà*, they started sprouting up like rutabagas. What is prompting me to write is that the equipment I have — a Roland JV-35 synth and Passport's Master Tracks 6.5 sequencing software on a Pentium 75 — is making it tough to utilize a lot of your tips.

For example, I had thought I was overestimating my sense of rhythm when tracks I would lay down played back out of kilter, and was glad to read Jim Aikin's March/April '97 column about MIDI timing slop. But I'm having some difficulty finding the aftertouch data. The closest I could

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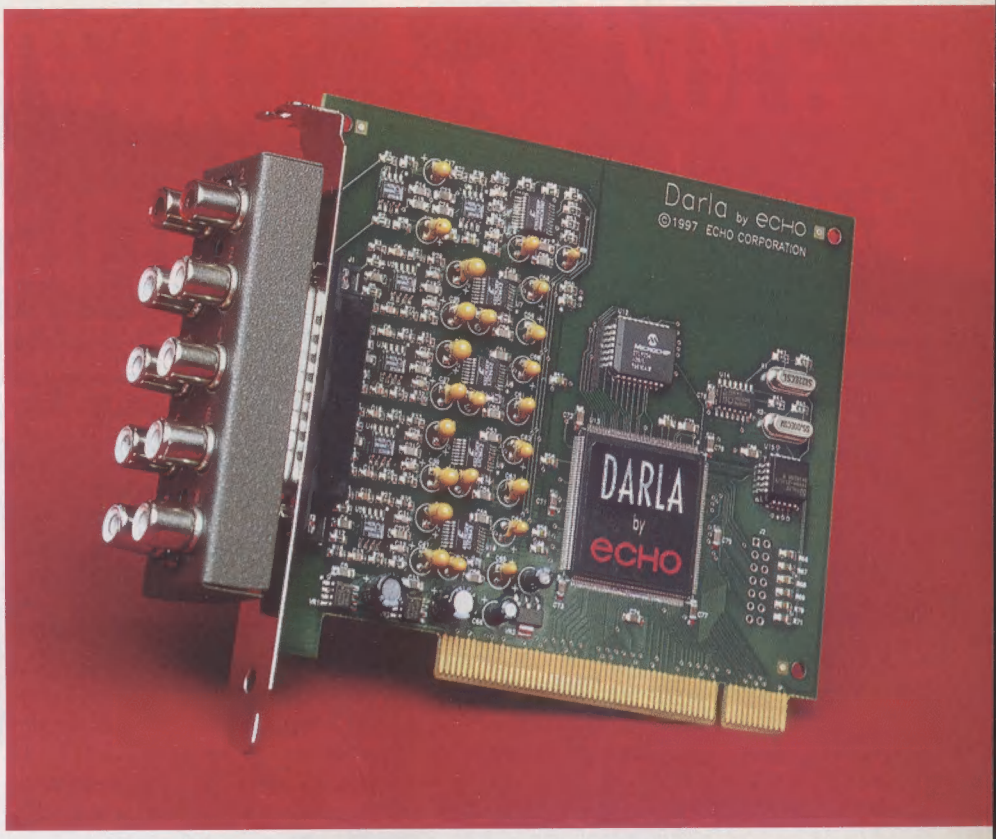
ILLUSTRATIONS: ROBERT PRINCE

Get Straight A's on Your Recording Projects



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READER SERVICE NO. 103

come was finding key pressure and channel pressure, but in the controller window for these two there was no data that I could find.

This leads to a larger request: I would really like to see comparisons of the more common sequencers and synthesizers. I started reading *M&C* with issue #2 or #3 and missed one more along the way, so maybe you have done this and I'm unaware of it.

Keep up the good work. The home CD article with the discussion of mixing [Jan/Feb '97] was a real treat.

Rene Shekerjian
via AOL

Rene — Excessive aftertouch (also called pressure) data in a MIDI sequence can be one source of playback timing irregularities, but since you've ruled that out, it's time to take a look at some of the other factors Jim mentioned. Try sliding individual notes in a chord forward or back in time by a few clock ticks so that they don't hit simultaneously — synthesizer timing response deteriorates as the number of simultaneous notes increases.

One M&C reader reported recently that his timing problems disappeared when he switched from his soundcard's MIDI interface to a dedicated one. For more timing tips, see the "MIDI File Troubleshooting" article on our Web site.

So Long, Pop

I've gotten a great deal of good information out of your magazine and am hoping that someone at your office may be able to help me find two software products I have been looking for. The first is what I would call a function generator — a software package that will allow me to generate and edit various waveforms on my PC and output them through my audio card (a Creative Labs Sound Blaster AWE32 with Roland SCD-15 wavetable daughterboard).

The second is a software package that can detect and eliminate scratches and pops from a .WAV file. My family owned a Packard Bell record recorder and I now have a collection of 78s that I would like to put on CD-R. However, the quality of the recordings is marred by the physical condition of the records.

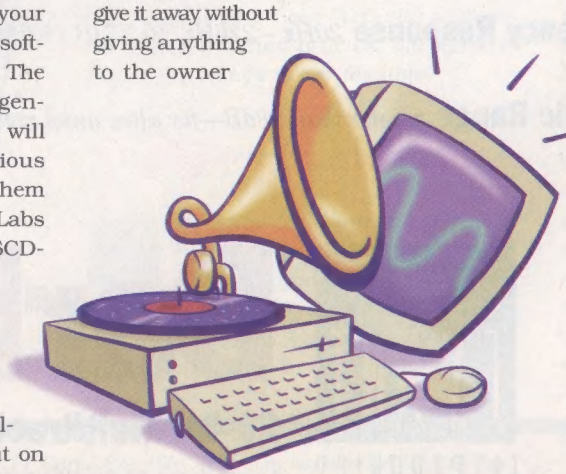
Bret A. Scott
Southfield, MI
via AOL

Bret — You have several options for vinyl restoration, including Sonic Foundry Sound Forge (with the optional noise reduction plug-in), Steinberg WaveLab (with the optional DeNoiser and DeClicker plug-ins), and Tracer Technologies DART Pro. We ran a Turbo Tips article on the Sound Forge noise-reduction software in our Jan/Feb '97 issue.

Sound Forge can also synthesize simple waveforms, though all three programs can record them from a test-tone CD. Alternately, you could use your soundcard's built-in synth or a shareware program like CoolEdit to generate waveforms.

What's Up, Doctrine?

In your Jan/Feb '97 issue you quoted Todd Rundgren as saying that you can't legally transfer ownership of CDs that you've purchased "without the original artist/producer/owner getting profit off that transaction." That's not correct. Section 202 of the Copyright Act ("Ownership of copyright as distinct from ownership of material object") codifies what is known as the "Doctrine of First Sale." This says that once you buy something in which a copyright is embedded — such as a CD or a book — you can sell, trade, trash, or give it away without giving anything to the owner of the copyright. You just can't copy it without the copyright owner's permission.



Al Wolfson
New York, NY
awolfson@wolfson.com

Tempo Tip

Luv your mag! Very informative articles. Can you guys do one on calculating the tempo of a .WAV file using Sound Forge 4.0? I'm getting into remixes and it will help me a lot. I use Sound Forge to record .WAV files and then bring them into Cakewalk 5.0 to do my MIDI work.

Amad
via Internet

Amad — Simply highlight one bar of the waveform (usually four beats), pull down Sound Forge's "Special" menu, and select "Edit Tempo." Enter the number of beats you've selected and the program will display the tempo in beats per minute.

You can also calculate tempos with the following formula, which we printed in our May/June '96 issue on samplers: ***(number of beats x sample rate x 60)/length in sample words = bpm.***

For example, let's say you've got a two-bar loop in 4/4. That's eight beats. Suppose the sampling rate is 32kHz, or 32,000 samples per second. The observed length of the loop happens to be 135,500 sample words. Therefore, (8 x 32,000 x 60) / 135,500 = 113.35 bpm. Happy looping!

Where the Nuts Come From

Just writin' to compliment you guys on putting out such a didactic and funny mag. And don't forget to score one more goal to Brazil on that "Brazilians vs. Aussies — the largest international market match" ("Input," Nov/Dec '96).

J.P. Ambrogi
Taubate, Brazil
via Internet

A Jolly Good Cello

I have read several issues of your magazine and find it all very fascinating. However, I wish you had

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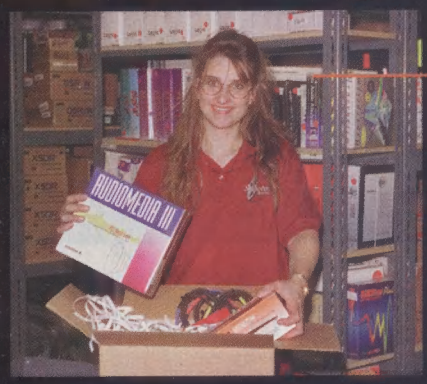
TECH SUPPORT AND SERVICE

This is Bruce. He works in our Technical Support and Service Department. He'll personally make sure you get your equipment up and running with a minimum of down time. And if you should ever need repair, we're factory authorized to service every item we sell right down to the component level.



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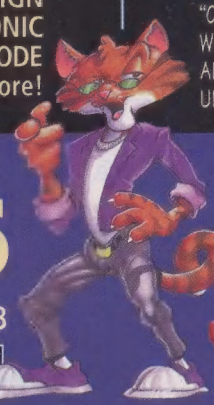

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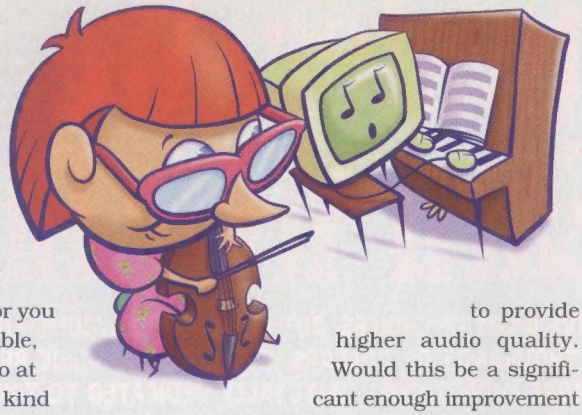

more features geared toward those who, like me, are absolute beginners in making music with the computer.

One topic I would especially like to see addressed is selecting the right computer for the task. I realize it would be virtually impossible for you to review every computer available, but it would be helpful for me to at least have information on the kind of features to look for. I'm an amateur cellist, and my ambition is to be able to make my own piano and orchestra accompaniment tapes to practice with, using a very basic keyboard synthesizer, sequencer, and recording setup.

I'm planning to buy a new Macintosh this year, and I'm positively terrified that I'll make the wrong choice and regret it for a long time afterwards. I like many of the features of the Performa 6400 and am intrigued by the fact that it has surround sound, but it doesn't have what the Power Mac 7500 and 7600 have — RCA phono input/output jacks, which are supposed to provide higher audio quality. Would this be a significant enough improvement in sound that I should consider choosing one of these Power Macs solely on that basis?

Sue Anders
via Internet

Sue — RCA jacks don't necessarily provide better audio than 1/8" phone jacks; their main benefit is sturdier construction. If you want to get into digital audio seriously, it would be wiser to spend the extra money on a dedicated audio interface card and bypass the Mac's middling onboard audio circuitry. (See the "How Do I . . ." column on page 75 for background on audio interface features.)

However, you don't need to worry about the digital audio details if you just want to make accompaniment tapes. You can do a fine job of that with a MIDI keyboard synthesizer, a sequencer, and virtually any computer. (As we reported last issue, pro musician Michael Hedges sequenced his last three albums with a 1986-vintage Mac Plus.) We'll elaborate on setting up a computer music system in a future issue, but any current Power Mac should provide you with years of music-making capability.

We're also working to pack more introductory information into M&C. Check out the numerous sidebars in this issue and the tutorial orientation of the reviews.

Good News

In the May/June '97 "Cutting Edge" section, we accidentally added a few hundred dollars to the price of Steinberg's ReBirth software synthesizer; it actually retails for $199. Also, Steinberg's new phone number is 818-993-4161.

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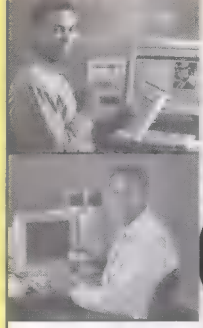

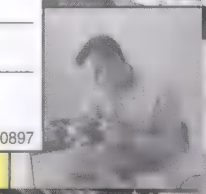

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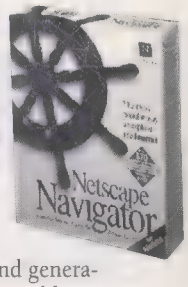

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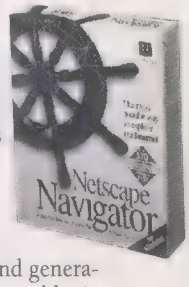

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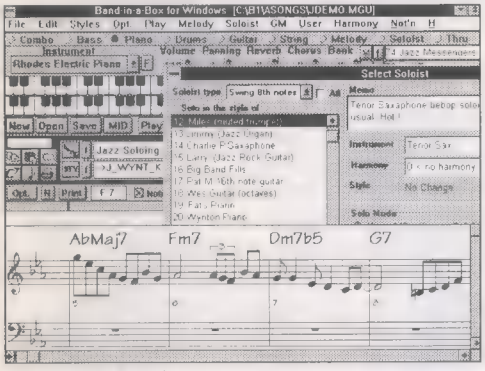
Type in the chords to any song, using standard chord symbols like C or Fm7b5, choose the style you'd like and Band-in-a-Box does the rest... Automatically generating professional quality five instrument accompaniment of bass, drums, piano, guitar & strings in a wide variety of styles.



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NEW! Additional features in Version 7.0

Band-in-a-Box 7.0 for Windows & Macintosh breaks new ground with over 60 new features!

Band-in-a-Box 7.0 is here! This major upgrade includes over 60 new features. We've added a an amazing new feature called "Automatic Soloing". Choose the type of soloist you'd like (from 100 available) and the program creates and plays a solo in that style, along to any song! Or create your own soloists. This is hot! These solos are of the highest professional quality, rivaling solos played by great musicians! And there's lots more in 7.0 – improved notation, step time/notation edit of StyleMaker patterns, scroll ahead option for notation, improved synth support, over 60 new features in all!

OUR CUSTOMERS LOVE VERSION 7.0! ***"Wow! The soloing sounds amazing... how can it do that?" "I love the notation improvements." "Another winner – thanks!" "You guys have added everything I wanted."***

NEW! Add-ons for Band-in-a-Box Version 7.0! Jazz, Rock & Bluegrass Soloist Disk Sets

- **Soloist Disk Set #2: "Killer" Jazz Swing Soloing $29**
- **Soloist Disk Set #3: Specialty Jazz Soloing $29**
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- **Soloist Disk Set #5: Bluegrass Soloing $29**
- **Bluegrass MIDI-FakeBook (50 songs) $29**

An exciting aspect of the Soloist feature in Band-in-a-Box Ver. 7 is that the program is able to increase its musical intelligence by analyzing new solos it is exposed to. It learns by "ear" and constantly gets better and better! Then the Soloist can incorporate the soloing we expose it to into its own playing. We've now created brand new soloist KnowledgeBases with dramatically enhanced results. We've created stunning new soloists in the jazz, rock and Bluegrass styles, and are offering them as new Soloist Disk Sets for Band-in-a-Box 7. The packages include **bonus styles** (some also include demo songs) to augment your BB with your favorite types of music.

SOLOIST PAK – ALL 4 Soloist Disks + Bluegrass MIDI-FakeBook on disks or CD-ROM $99

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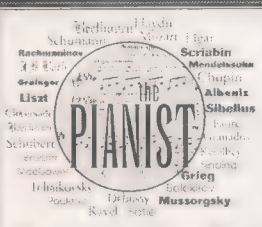

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PLUS... *Music Trivia Game, "Guess the Song", program notes, biographies, music dictionary (on disk) & more!*

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This program makes it "too easy" to learn to be a great jazz PIANO player!

Top jazz/studio pianists play 60 jazz standards in a wide variety of styles.

Hear the music with CD-quality through your sound card or MIDI system. Most pieces have bass/drums as well as piano so you get a full sounding jazz trio for the tunes! Jazz Trivia game & Guess the Song game, program notes, biographies & music dictionary (all on disk).

The Jazz Pianist Volume 2

Volume II upgrade - $49 (requires The Jazz Pianist) • first time purchase: Volume 1 & 2 - $98

60 more fabulous jazz standards for Volume 2, complete with new program notes and biographies!

The Ragtime Pianist™ $49

Over 90 ragtime & early jazz piano standards, played on MIDI keyboard by top Ragtime Pianists... and featuring world-renowned Ragtime performer JOHN ARPIN!

Hear virtuoso performances of every Joplin rag in this program, as well as many other rags, CakeWalks, waltzes & other Ragtime Era tunes by Eubie Blake, Joseph Lamb, Daniels and, of course, Scott Joplin.

The New Orleans Pianist™ $49

Over 60 "New Orleans Style" piano music standards, played on MIDI keyboard by top New Orleans pianists Henry Butler, Jon Cleary, Tom McDermott, Joel Simpson & David Torkanowsky playing a wide variety of New Orleans, R & B, Blues & Ragtime piano music.

The Gospel Pianist™ $49

Over 50 Gospel style piano pieces played on MIDI keyboard by top Gospel pianists Louise Rose, Davell Crawford, Henry Butler, Sam Berfect, Derrick Bethune, Joel Simpson & Jon Cleary. The "Gospel Piano" style underlies much of the blues, jazz & popular music played today.

The Christmas Pianist™ $49

This software includes great piano performances of over 50 all-time favorite Christmas songs and carols – ideal for listening or singalong! On-screen lyrics, notation & piano keyboard, piano notation printout, background playback, Music Trivia & Guess the Song games & more!

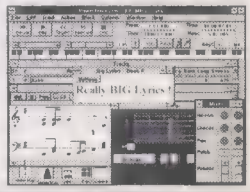
NEW! Ver. 3.5 PowerTracks Pro™ ONLY $29 upgrade $15

SEQUENCER/NOTATION/PRINTING/WAVE SUPPORT FOR WINDOWS (IBM)

"Solid sequencing at an unbelievable price" Electronic Musician Sept. 93

NEW FEATURES in 3.5... Enhanced notation window (32nd notes, etc.) • Karaoke window • Notation Scroll ahead • Notation clean mode • Align music to click track • Force all files to PPQ option • Improved hand splitting • Intelligent enharmonics

In versions prior to 3.5, we added major features like music notation, wave files, lyrics, chord symbols & printout. Now we've added many new features. We've added a big "Karaoke" Style Window to display lyrics. The notation is enhanced with support for finer resolutions like 32nd notes. You can align a rubato piece to a click track. We've enhanced the intelligent piano hand splitting routines. The enharmonics are intelligently chosen based on the chord symbols & more! *Powertracks for DOS included FREE (NOTE: DOS version doesn't support music notation or other graphical features).*



NEW! The Bluegrass Band™ $49

Virtuoso live performances of 50 Bluegrass standards!

These MIDI files are great! As you listen to the tunes, you can single out any of the instruments using the on-screen fretboard display, tablature or notation **PLUS**... Lots of Bluegrass pictures, bios, & trivia (all on disk) & much more. Our most "feel good all over" program so far. Includes: Wildwood Flower, Sally Goodin, Cripple Creek, Fire on the Mountain, Pigtown Fling, Red Haired Boy, Jesse James & many more!

NEW! The Jazz Soloist™ Vol. 3 $49

Vol. 1 (50 pieces) $49 • Vol. 2 (50 pieces) $49 • Vol. 3 (60 pieces) $49

The Jazz Soloist is a music program with professional jazz quartet arrangements. Each song features a great jazz solo played by top jazz musicians, as well as piano comping, bass & drums. Vol. 3 of the Soloist series features Latin, Blues, & Jazz Waltz stylings. Includes Jazz Soloist program with MIDI files, & also files in Band-in-a-Box format. Sight-reading was NEVER so much fun before the Jazz Soloist series! (NOTE: Mac users get on-screen-notation only when running the files in Band-in-a-Box. Volumes work together or as standalone programs.)

The Jazz Guitarist™ (Windows, Mac, Atari) $49

A music program containing a huge collection of over 60 jazz standards, played on MIDI guitar by top jazz/studio guitarist Oliver Gannon

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654 GM/GS sounds, 9 drum sets & 2 FX sets, 16 part multitimbral, 64 voice polyphonic, front panel LCD screen & external controls. On-board digital reverb, delay and chorus effects & 2 band EQ. Wave sounds using immense 16 MB wave memory. Built-in standard MIDI interface.

Roland Sound Canvas SC-88ST-WH sound module $399
654 GM/GS sounds, 9 drum sets & 2 FX sets, 16 part multitimbral, 64 voice polyphonic, 32 part LEDs. On-board digital reverb, delay and chorus effects & 2 band EQ. Wave sounds using immense 16 MB wave memory. Built-in standard MIDI interface.

Roland Sound Canvas GS/GM SC-55ST-WH sound module $299
354 GM/GS sounds, 9 drum sets & one SFX sets, 16 part multitimbral and 28 voice polyphonic. On-board digital reverb, delay and chorus effects & 2 band EQ. Wave sounds using immense 16 MB wave memory. Built-in standard MIDI interface

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Cutting Edge

by John Krogh & Debbie Greenberg

For more information about the products and companies featured in Cutting Edge, just fill out the free Reader Service Card bound next to page 65 and drop it in the mail.

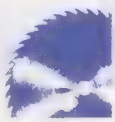
Interactive Music Technology, founded by David Van Koevering and synthesizer pioneer Dr. Bob Moog, has developed a software-based, touch-screen-controlled music system called Interactive Music Touch. The first product to integrate this technology is the **Van Koevering Interactive Piano**. The line includes a console cabinet ($9,975), an ensemble model ($9,475), and mini and baby grands (prices not available). The pianos feature an 88-key Fatar keyboard with weighted action for an acoustic piano touch, a built-in MIDI synthesizer with 128 sounds, the ability to layer five sounds simultaneously, and unlimited software-based play-along musical styles. The Intelli-pedal feature lets you assign functions such as page turn and pitch-bend to each of the three footpedals. The sound system includes six speakers and a custom three-channel power amplifier; analog RCA audio inputs and outputs are also provided.

Interactive Piano's onboard modem offers a direct link to the Van Koevering Music Hall, a Web site with access to technology updates, general information, music software, and new sounds and styles. The piano is accompanied by a CD-ROM user's guide and *Piano Accompaniment by Ear with David Wayne Lawrence, Level 1*. Other titles currently available in touch-screen format are Jump! Music's Magic Player and Piano Discovery for Kids, and Tune 1000's Karaoke MIDI File Player. **Contact:** Van Koevering, 11324 Aurora Ave., Des Moines, IA 50322; 515-253-0300; fax: 515-253-0400; e-mail: info@vankoevering.com; Web: www.vankoevering.com. ***Circle #152 on reader service card.***

PC

Take it on the run, baby. **E-mu's EMU8710** ($395) is a PCMCIA soundcard aimed at multimedia presenters, location audio producers, and musicians on the go. The card can be installed in any 75MHz (or faster) Pentium-based computer equipped with a PC Card slot and Windows 95 (Mac drivers are under development). It offers 32-note polyphony and digital audio playback through its 1/8" stereo headphone audio output. Two megabytes of General MIDI and GS sounds are available in ROM. SoundFonts (a sound format originally developed for Creative Labs' AWE32 card) and .WAV files can be loaded into the 512Kb of internal RAM, giving you more sounds to play with.

An optional MIDI/audio breakout box ($49) provides stereo line-level audio input, S/PDIF digital audio output, and MIDI I/O in addition to a stereo line/headphone output. With the breakout box connected, you can record 16-bit, 44.1kHz audio. ***Circle #153 on reader service card.***



E-mu has teamed up with **Don Buchla** (a pioneer of synthesis and alternative controllers) to create the **Thunder KAT** (price not available), a multi-voice MIDI percussion controller with a synthesis engine designed by E-mu. The playing surface can be set up with multiple zones that allow you to control 16 channels at once. Optical sensing is used to detect how hard and where you hit the playing surface, a system that reportedly registers subtle movements, including those used in finger drumming styles. The synth engine is 32-note polyphonic and provides simultaneous realtime control over such parameters as pan, pitch, volume, timbre, and filter cutoff frequency. **Contact:** E-mu Systems, 1600 Green Hills Road, Ste. 101, P.O. Box 660015, Scotts Valley, CA 95067; 408-438-1921; fax: 408-438-8612; Web: www.emu.com. ***Circle #154 on reader service card.***

PC

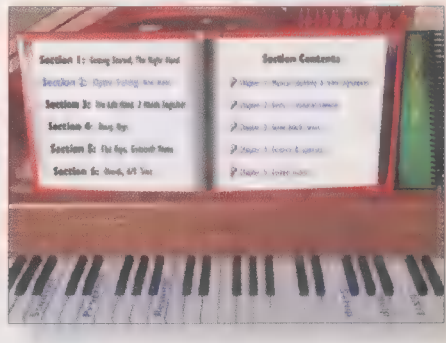
If you have an ADAT and a PC, how do you get audio from one to the other and keep everything in the digital domain? **Sonorus** has one solution with its **StudI/O** 16-channel PCI digital audio interface ($989). This card offers two 8-channel Alesis ADAT (8-track digital tape recorder) optical interfaces that let you use the analog-to-digital converters of the ADAT as the front end for recording audio into your computer. Audio can also be digitally transferred back and forth between computer and ADAT. The included software drivers are compatible with most digital audio workstation programs for Windows 95. Both of the optical interfaces can also be configured in software to function as stereo S/PDIF I/Os, making the card useful for mastering applications such as mixing down and recording to DAT. An additional 18-bit 1/4" stereo analog output is available for monitoring purposes. **Contact:** Sonorus, 111 East 12th St., #2, New York, NY 10003; 212-253-7700; fax: 212-253-7701; e-mail: info@sonorus.com; Web: www.sonorus.com. ***Circle #155 on reader service card.***

These days, you can buy a great-sounding MIDI keyboard or sound-card for a lot less than you might have paid even a year ago. Oddly enough, MIDI samplers seem to be the last things to follow this trend of offering higher quality at a lower price. **Akai** hopes to change this with their eight-note polyphonic **S20 Phrase sampler** ($649). It comes with 2Mb of sample RAM that can be increased to 18Mb with a 72-pin SIMM chip. The S20 has 16 pads that let you play samples and program patterns drum machine-style. Pad performances can be recorded into its four-track sequencer or sent to its MIDI output and recorded into an external sequencer. User-programmable sample parameters include loop start and end points, pitch, and tempo (handy for rhythmic samples). Samples and sequences can be loaded and saved via the internal floppy disk drive. **Contact:** Akai, 1316 E. Lancaster Ave., Ft. Worth, TX 76102; 817-336-5114; fax: 817-870-1271; Web: www.akai.com/akaipro. ***Circle #156 on reader service card.***

PC

Event Electronics hopes to attract some fresh faces to the world of digital multitrack recording with **Gina** ($499), a PCI card that lets you record audio into your computer. The card is equipped with S/PDIF digital audio I/O and comes with a separate breakout box that houses two 1/4" analog inputs and eight 1/4" analog outputs. Gina offers full duplex operation, and lets you use the digital and analog I/Os simultaneously. This means that you can record four channels while playing back ten channels, provided you're using multitrack recording software that can take advantage of this feature.

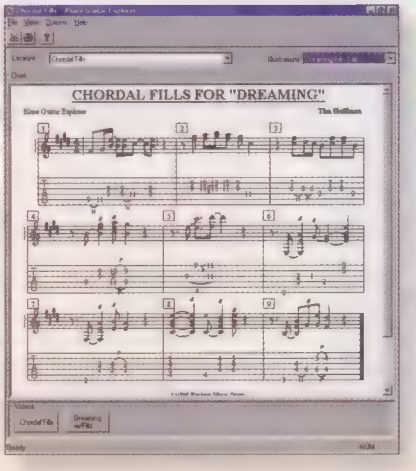
Gina is compatible with most audio editing/recording software, such as Steinberg's Cubase Score and Emagic's Logic Audio. The Windows compatible system comes with a custom version of Syntrillium's CoolEdit software, so you can be up and running even if you don't already own multitrack recording software. A Power Mac-compatible system should be available in Summer '97. **Contact:** Event Electronics, P.O. Box 4189, Santa Barbara, CA 93140-4189; 805-566-7777; fax: 805-566-7771; e-mail: info@event1.com; Web: www.event1.com. ***Circle #157 on reader service card.***



PC

"I'd like to brush up on my piano playing, but I don't have the time for regular lessons." Sound familiar? **Voyetra** has introduced ***Teach Me Piano*** ($79.95), a piano course on CD-ROM. Its Keyboard Lessons section offers six levels of training with more than 150 lessons and 100 exercises for beginning and intermediate students; you can learn to play more than 75 popular songs. If you have a four-octave (or larger) MIDI keyboard connected to your PC, an interactive scoring system will evaluate your performance.

Once you learn a song, you can visit the Performance Hall section and listen to the piece or play along with MIDI orchestral accompaniment. You can choose the instrument sound, tempo, and volume, as well as print the songs as sheet music. The Musician's Reference section uses diagrams, illustrations, and definitions to explain music notation and common musical terms. And the MediaCheck section can test and troubleshoot the digital audio and MIDI features on a multimedia computer. **Contact:** Voyetra Technologies, 5 Odell Plaza, Yonkers, NY 10701; 800-233-9377 or 914-966-0600; fax: 914-966-1102; e-mail: info@voyetra.com; Web: www.voyetra.com. ***Circle #158 on reader service card.***

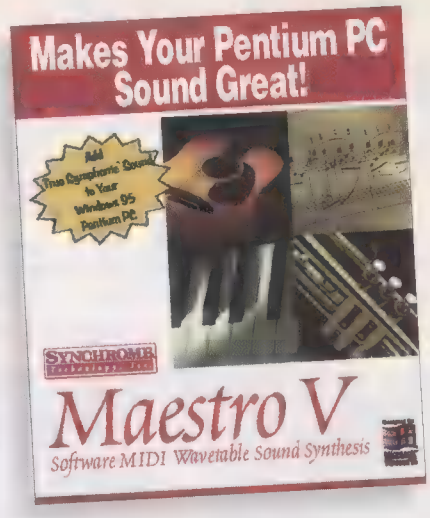


PC

Have you ever noticed that great guitarists can make playing their instruments look effortless? Recording artist Tim Huffman has demystified some of the secrets of guitar playing with the **Blues Guitar Explorer** instructional CD-ROM for Windows 95 ($59.95). Intended for intermediate guitarists, this CD-ROM demonstrates R&B chord forms, chordal fills, turnarounds, slide guitar, and blues scales. Each song has two tracks — one with guitar and one without. You can play the disc in a CD-ROM drive or normal stereo CD player.

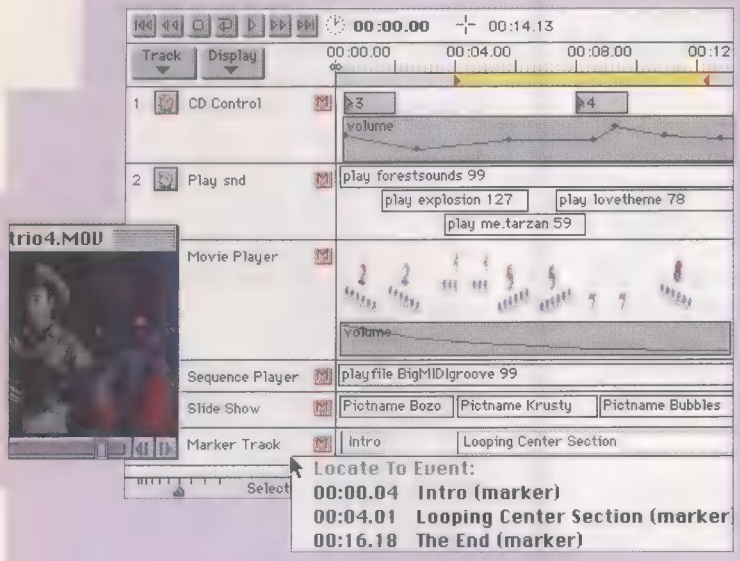
Video features include three camera angles: wide (both hands), left hand only, and over the right shoulder. You can loop a segment, select a half-speed option, and mute the guitar part at any point during a video. The video, chord grids, and chord charts can be viewed simultaneously. When you double-click on a given chord grid, a .WAV file plays the chord. All illustrations can be viewed or printed. **Contact:** 888-83CDROM (23766); Web: www.explorermusicgroup.com. ***Circle #159 on reader service card.***

Cutting Edge



PC Synth on a disk: The **Maestro V** software synthesizer ($39.95) adds **Synchrome**'s True Symphonic wavetable synthesis to your Pentium-based soundcard (8- or 16-bit) or sound chip. It offers full General MIDI support with 2Mb of Kurzweil sounds, 128 GM instruments, 47 percussion instruments, 24-note polyphony, and reverb. The package includes the software MIDI wavetable drivers, Synchrome Media Rack (MIDI player, .WAV file player/recorder, CD player, mixer, and talking alarm clock), and 32-tune MIDI sampler pack. The Maestro V can be played by your sequencer or a MIDI keyboard. **Contact:** Synchrome Technology, 3004 Mission St., Ste. 180, Santa Cruz, CA 95060; 408-471-1550; fax: 408-471-1557; Web: www.synchrome.com. ***Circle #160 on reader service card.***

Updates

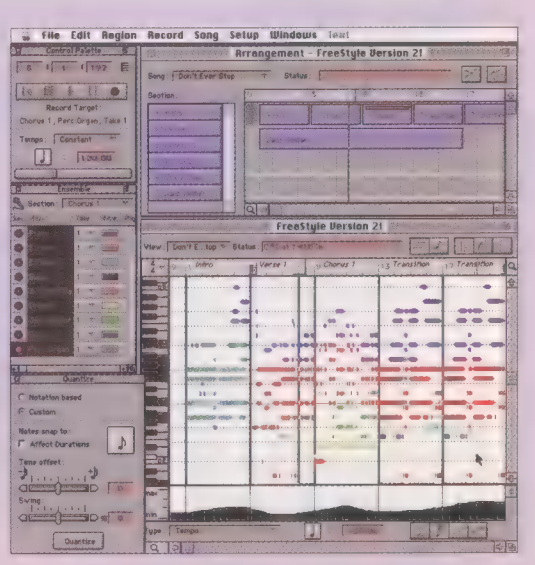


Opcode has upgraded **Max** (profiled in the Sept/Oct '96 *M&C*), a realtime object-oriented programming language for creating custom Macintosh music programs. Musicians, composers, and multimedia authors use Max to simultaneously control MIDI, digital audio, QuickTime movies, lighting, and external hardware. **Version 3.5** ($495; upgrade $99.95) adds native PowerPC code, which gives Max more efficient timing, faster screen redraws, and better handling of QuickTime movies.

Other enhancements include graphic MIDI file editing and OMS Time Manager synchronization. You can now control the size, appearance, and placement of Max patcher windows. With the W Protocol object (a component of the programming language), multiple Max users can interact with each other via the Internet. Version 3.5 also comes with Stat-Media's *Instant Buttons & Controls 2.0* CD, which includes over 1,000 graphical user interface images that can be used in the programs you create. **Contact:** Opcode Systems, 3950 Fabian Way, Ste. 100, Palo Alto, CA 94303; 415-856-3333; fax: 415-856-3332; e-mail: info@opcode.com; Web: www.opcode.com. ***Circle #161 on reader service card.***

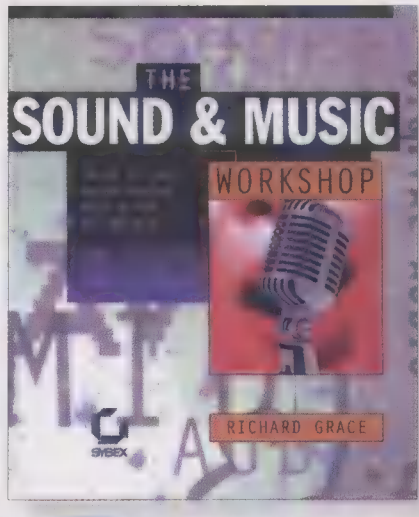
Version 2.0 of **Mark of the Unicorn's FreeStyle** MIDI sequencing software ($195; upgrade $79.95) offers PowerPC native code and a new feature called Sense Tempo, which enables FreeStyle to identify the beats and measure boundaries in your performance and display the notation accordingly in real time. You can also align FreeStyle's beats and barlines with a pre-recorded MIDI performance using the program's new beat-adjustment features. And version 2.0 supports tempo changes — you can draw them in the graphic editor or record tempo slider movements as your music plays. This new version also provides SMPTE synchronization, so (with optional hardware) you can slave FreeStyle to a tape deck and record audio tracks that are synchronized with your MIDI performance.

Notation enhancements include score and recording transposition options and intelligent note-spelling algorithms. Other new features include note-velocity and duration scaling, an extensive MIDI Monitor window, nameable takes, and a Duplicate Take command. **Contact:** Mark of the Unicorn, 1280 Massachusetts Ave., Cambridge, MA 02138; 617-576-2760; fax: 617-576-3609; e-mail: techsupport@motu.com; Web: www.motu.com. ***Circle #162 on reader service card.***



Putting audio on the Internet just got easier with **Sonic Foundry's** digital audio recording/editing software, **Sound Forge**. **Version 4.0a** ($495; update free from Web site for registered users of v. 4.0 or $20 for CD-ROM update) lets you save audio files in RealAudio format (discussed in the Jan/Feb '97 *M&C*), which can be played over the Internet in real time. Sound Forge's audio plug-in architecture now supports Microsoft's DirectX, which enables video display/synchronization and the ability to hear the effect of audio plug-ins in real time. User preferences can now be saved as libraries, letting you share Sound Forge configurations with other users.

CD Architect (price not available), also from Sonic Foundry, enables you to record audio from your computer onto a recordable compact disc. CD Architect can import, edit, and arrange audio from compact discs, DAT tapes, or your hard drive. Audio files can be arranged in any order, with user-programmable crossfades between each file, then recorded onto a CD. Up to 99 tracks can be recorded onto a single disc. CD Architect is available as a stand-alone program or as a plug-in for Sound Forge. **Contact:** Sonic Foundry, 100 Baldwin St., Ste. 204, Madison, WI 53703; 608-256-3133; fax: 608-256-7300; e-mail: sales@foundry.com; Web: www.sfoundry.com. ***Circle #163 on reader service card.***



To learn more about composing, recording, and playing music on your PC, you might want to check out ***The Sound & Music Workshop*** ($29.99), a step-by-step handbook that shows how to use a PC to get the most out of digital audio technology. Computer user and musician Richard Grace explores hardware options from soundcards to microphones to MIDI devices, and discusses the best software to use for sound recording and editing. The book offers hands-on tutorials, project walk-throughs, and product reviews, as well as a companion CD that contains evaluation copies of Syntrillium Software's CoolEdit (shareware sound editor), Cakewalk Pro (MIDI sequencer), and Passport Designs' Encore (notation software). Sound files are included to illustrate the book's major concepts. Original MIDI songs written, arranged, and recorded by Grace are also included on the CD. **Contact:** Sybex, 1151 Marina Village Pkwy., Alameda, CA 94501; 510-523-8233; fax: 510-523-2373; e-mail: info@sybex.com. ***Circle #165 on reader service card.***

Sound and Music for Multimedia: Audio Effects for Games and Interactive Software ($34.95) is a comprehensive guide to using sound written by composer/producer David Javelosa. *Music & Computers* columnist The Fat Man served as technical editor. The book covers everything from the evolution of synthesizers, games, and music to the technology, design process, and tools of the trade. Javelosa describes scoring for multimedia, virtual reality, surround, and 3D sound. He explains how to turn live performances into usable sequencing material and how to convert any sound into a clean, portable audio effect. Other topics of discussion: samples vs. synthesis, MIDI vs. digital audio, and 8- vs. 16-bit resolution.

A companion CD-ROM for Mac and PC offers game music and sound effects from different game systems, a multimedia presentation, original compositions that highlight techniques from the book, and demo versions of several programs (Opcode Vision, Passport Master Tracks, Emagic MicroLogic, MOTU FreeStyle, Cakewalk Pro Audio, Ilio Entertainments Sample Library, and more). *Sound and Music for Multimedia* can be found in stores or purchased directly from the publisher. **Contact:** M&T Books, 115 West 18th St., New York, NY 10011; 212-886-9200 or 800-488-5233; fax: 212-633-0748; Web: www.mandt.com. ***Circle #164 on reader service card.***

Net News

The sun is shining on Thomas "Dolby" Robertson. His company, Headspace (www.headspace.com), provides or enables sound and music for Internet applications. Current Headspace partners include such notables as Netscape, WebTV, and Yahoo. And a partnership between hardware/software mogul Sun Microsystems and Robertson's small San Mateo, California-based company was announced during the JavaOne conference in early April. Under this agreement, Sun has licensed Headspace's software audio engine, Beatnik, which will serve as the sole provider of audio for the previously silent JavaSoft applications. Beatnik enables computers and table-top boxes, such as the ones manufactured by WebTV, to play audio — including music, vocals, and sound effects — in real time, without the need for expensive third-party hardware. The processing needed to create audio is done entirely in software, and requires only a DAC (digital-to-analog converter) to output stereo audio.

This licensing agreement is significant in the development of audio on the Net. Currently, there are many Internet music delivery systems, with companies like Microsoft and Yamaha competing in the same arena (for more background, see our Mar/Apr '97 cover story). By teaming up with such a major hardware/software manufacturer as Sun, Headspace is taking steps to ensure its place among Internet audio solutions. Robertson told an attentive audience at the JavaOne conference, "I want this [audio engine] to be something that cannot be owned, and yet I want this to be something that will be everywhere — I want to paint the world with this engine." Shortly after the conference, it was announced that Microsoft had purchased WebTV from Sony/Philips. What this means for Headspace, whose audio engine is currently used in WebTV set-top boxes, isn't clear.

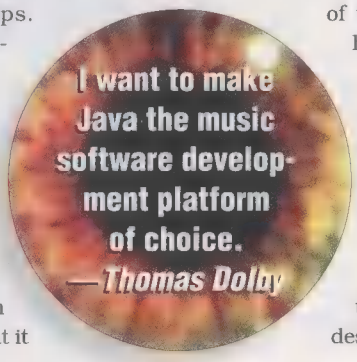
M&C caught up with Robertson following the Computer Game Developers' Conference in late April to get his thoughts on Java, the Internet, and what it means for musicians. Here's what he had to say.

With Java proliferating on the Net, what kind of impact would you like to see Headspace make in the music software development arena?

I'd like to provide an application development framework for them that meets all of their needs — matching and exceeding the resources they've had in the past with specific operating systems like Mac and Windows — and to make Java the music software development platform of choice. I think it's been very damaging to several of the music software manufacturers that they initially developed for Atari or Mac without anticipating how important it would be to be available on other platforms.

The development of software to date has been largely based on familiar models from the professional recording world. For example, the first MIDI sequencers looked like a track sheet. We've gradually hit on the idea that sequencers, samplers, hard disk recording, etc., can do stuff that isn't possible with their analog counterparts.

What's interesting is that the professional music industry has unintentionally limited its penetration into the market by directing its efforts toward people who were already involved with the standard conventions of the industry. For example, if you've been in a recording studio, you could instantly relate to a sequencer or a hard disk editor, but that excludes the tens of thousands of people who have never set foot in a studio. Why do these people have to assume all of the baggage that comes with that experience? A lot of effort has been made to recreate the same ergonomic controls of a mixing console or multitrack tape recorder on the desktop computer. I think it's a lot of wasted resources. The computer should be used to provide an intuitive interface instead of simply replicating analog devices, making the creation of music with computers far more powerful and accessible to a wider range of people.



Are you working toward this goal right now?

As a matter of fact, we're already talking to companies about building dedicated boxes that run the Java virtual machine; specifically drum machines, sequencers, and things like that. Because of the ubiquity of Java, companies would then be able to read and write [code] to industry standard formats that could go back and forth between hardware and software — anywhere Java is.

Do you see a new breed of musician, a sort of "Web musician," emerging because of this technology?

Definitely. I think that in the near future, somebody getting into making music themselves could opt to work entirely with Web-based tools. Probably very soon they might not need to own a 19-inch rack with a bunch of modules. Instead, they could be getting everything they need — software synthesizers, plug-ins, filters, digital audio recorders — all from the Internet. Not only that, once they're done creating their work, they won't need to spool it off to DAT, CD, or any sort of linear medium, because the Internet gives them all of the distribution channels they'll ever need. In other words, I'm on my computer and so is my audience. What else do you need?

PHOTO: GEORGE LANG

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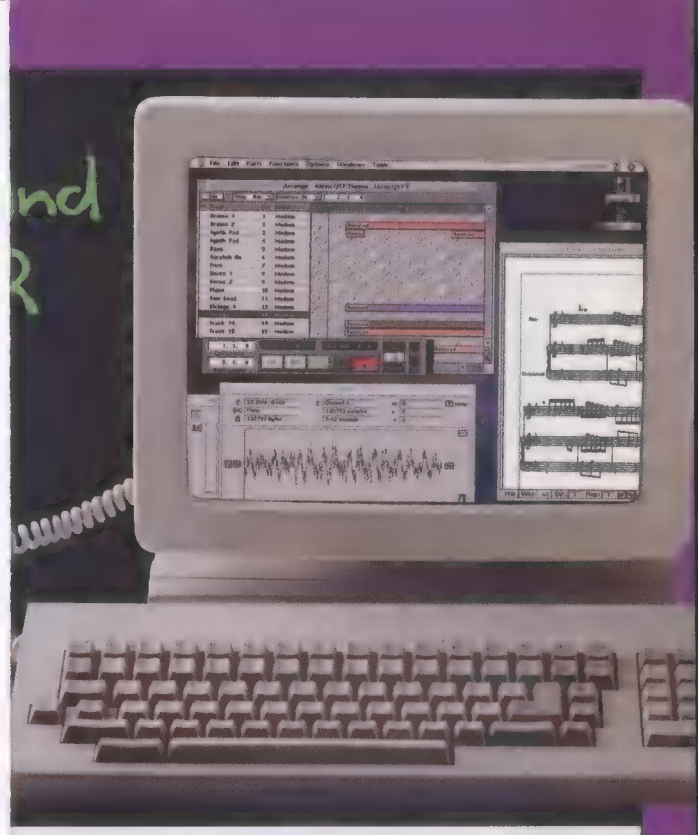

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Net News

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I want to make Java the music software development platform of choice.
—Thomas Dolby

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ALESIS

Fun Music Software

You can learn surprising things at cocktail parties. This particular party happened a month ago in the presidential suite at the Computer Game Developers' Conference. I was chatting with one of the world's leading composers of interactive music and mentioned that *M&C* was assembling a cover story on fun music software.

His face lit up. "Oh! Have you seen Harmonix?"

He told me about a program from a new company called Harmonix Music Systems that creates truly interesting music in response to joystick movements. It turned out that the program, called Axe, won't be shipping until later this summer, but a week ago, Harmonix dropped by to demonstrate it. I invited some of my buds at *Keyboard* (all of whom are accomplished musicians), and was surprised when one person argued vehemently that no "music" produced with just a joystick would be worthwhile. *Music* requires effort, he said.

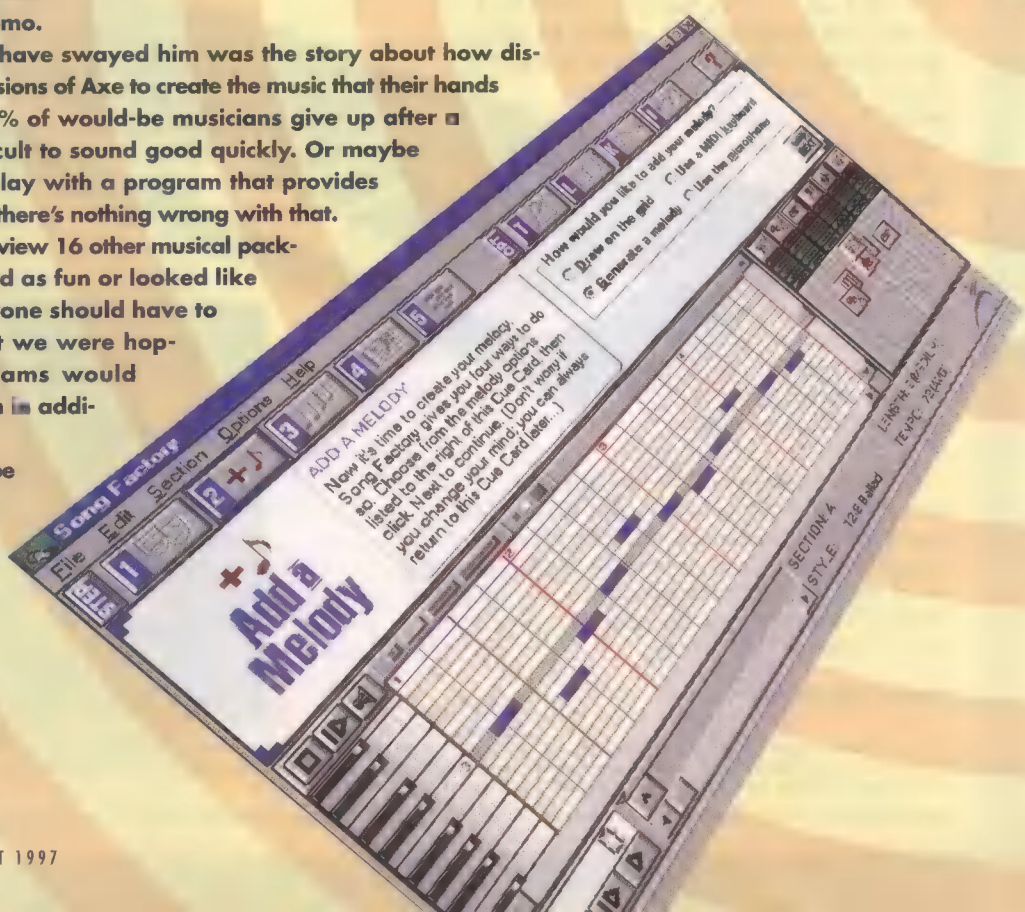
He backed down after the demo.

One of the things that might have swayed him was the story about how disabled people were using beta versions of Axe to create the music that their hands couldn't. Or the statistic that 90% of would-be musicians give up after a few lessons because it's so difficult to sound good quickly. Or maybe he just realized that it's *fun* to play with a program that provides instant musical gratification, and there's nothing wrong with that.

In the pages that follow, we review 16 other musical packages that were either advertised as fun or looked like they might be fun. Not that anyone should have to justify having a good time, but we were hoping that some of these programs would offer lasting musical gratification in addition to the instant kind.

Many did. Others turned out to be flawed, yet we still thought the approach they took to music-making was interesting. (You never know where inspiration will come from.) It's also nice to note that all of the programs here cost under $100.

Enjoy. —*David Battino*

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Setup
Mixer
Jam Grid
Blues
Jazz
Polka
Funk
Rock
Country
Reggae
Hip Hop
Metal
Disco
Waltz
120
Melody
Follow Lyrics

Mac/Atari/Amiga

AESTHETIC ENGINEERING

Music Mouse 2.1

(Mac: $29 via e-mail, $49 for disk and manual; Amiga or Atari: $30).

Mouse-driven musical instrument that outputs MIDI data.

System Requirements: *Mac:* Any Mac with QuickTime 2.0 or later (for internal audio) or MIDI interface and MIDI sound module. *Atari:* Atari ST with MIDI sound module. *Amiga:* Any 52Kb disk space.

Some music programs emulate tape recorders, backup bands, or notation paper; this one is a musical instrument in itself. Music Mouse is a tiny program, short on frills but long on both instant gratification *and* staying power — it has been around since 1986, and I still like playing with it. Over the years, Music Mouse has been featured on Laurie Spiegel's CD *Unseen Worlds*, ported to the Amiga and Atari ST, distributed by several companies (none of whom really knew quite what to do with it), and even picked up a "five mouse" review (the highest possible score) in *MacUser* magazine. In the process, it has acquired something of a cult status, and a fiercely loyal — if not exactly huge — following.

The concept is simple: You move the mouse within a grid; moving up or right increases the pitch, while moving down or left decreases the pitch (it's impossible to hit any "wrong" notes because they're constrained to one of six scales). There are four voices, which default to three voices on the vertical axis and one voice (think of it as the bass or lead line) on the horizontal axis. However, you can also set up the program with a single line that moves either horizontally or vertically, or two voices per axis in parallel or contrary motion.

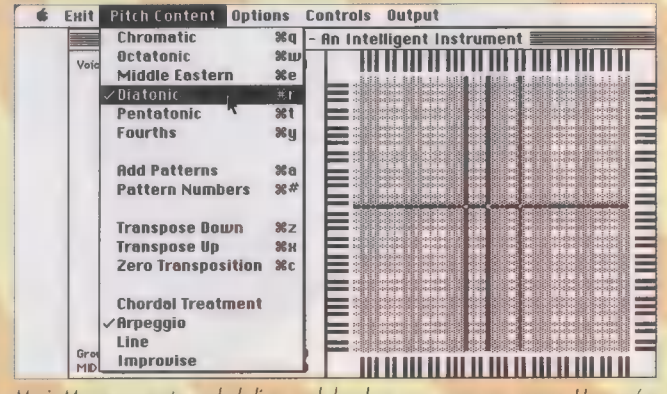
The Mac and Amiga versions use either MIDI or onboard sounds, transmitting on your choice of MIDI channels or presets. (The Atari version is MIDI-only.) Music Mouse can drive any generic MIDI interface connected to the modem port and supports 0.5, 1, and 2MHz data rates.

You can invoke several performance options with the QWERTY keyboard, such as changing volume or velocity, adding portamento (a pitch glide between consecutive notes), selecting legato mode, and much more. Also cool: an option that arpeggiates chords rather than playing them all at once, and an "improvise" mode that keeps changing the rhythm and chord tones you hear.

Music Mouse is fun to play on a number of levels. It's about as close as you can get to instant gratification, but it's also a very meditative kind of experience. To get mesmerized for a while, set up a pentatonic scale and a suitably ethereal synthesizer patch; or use the default scale with a guitar patch and generate an endless supply of pleasing contrapuntal melodies. Version 3.0, slated to come out sometime before the end of the century (program upgrades have been consistent, but introduced on, shall we say, a leisurely basis), will add simplified staff notation, MIDI file recording, and the ability to save user setups.

In a perfect world, Music Mouse would have more scales to choose from. Meanwhile, the program gets a major thumbs-up for its elegant simplicity, ease of use, staying power, and imagination. If any program has defined fun music-making on the Mac over the years, it's this one. —*Craig Anderton*

Contact: Aesthetic Engineering/Laurie Spiegel, 175 Duane St., New York, NY 10013-3309; fax: 212-966-7176; e-mail: musicmouse@kagi.com; Web: www.dorsai.org/~spiegel/. Mac demo available at www2.factory.com/spiegel/ls_programs.html. ***Circle #167 on reader service card.***



Music Mouse generates melody lines and chords as you move your mouse. Here we've restricted its output to notes in a diatonic scale. The chord part (controlled by horizontal mouse movements) is set to arpeggiate, producing a strumming effect.

PC/Mac

COMPUTER KARAOKE

Kids' Edition Ages 2–6, Vol. 1; All-Time Favorites, Vol. 1 ($29.95 each)

Sing-along karaoke CD-ROMs.

System Requirements: *PC:* Windows 3.1/95/NT, multimedia soundcard. *Mac:* System 7.5 or greater, 8Mb RAM, CD-ROM drive.

While many musicians blame it for everything from the dearth of paying gigs to the decline of civilization as we know it, I'll let you in on a dirty little secret: Karaoke is fun. Last Saturday night found a group of otherwise normal folks dancing around the rec-room computer, wearing silly hats, waving our arms in the air, and singing for all we were worth: "*Why*–Em–Cee–Ay!!!"

The aptly named Computer Karaoke Corporation offers a large assortment of titles for the home computer. I looked at two: a disc geared for kids ages 2–6 and one for adults called *All-Time Favorites*.

Since the program uses .WAV files instead of MIDI, playback is the same regardless of your soundcard. How does it sound? Pretty dang good, actually. Someone took time with the arrangements, and background vocals add a lot to the fun. It's even better if you connect to the stereo and blast away.

Loading and setup couldn't be easier (providing you can read, of course) and only needs to be done the first time. Navigating the interface is straightforward, though little bitty squirts may need assistance. (I feel that kids like big, easy-to-grasp icons and a high degree of

The Logic System:

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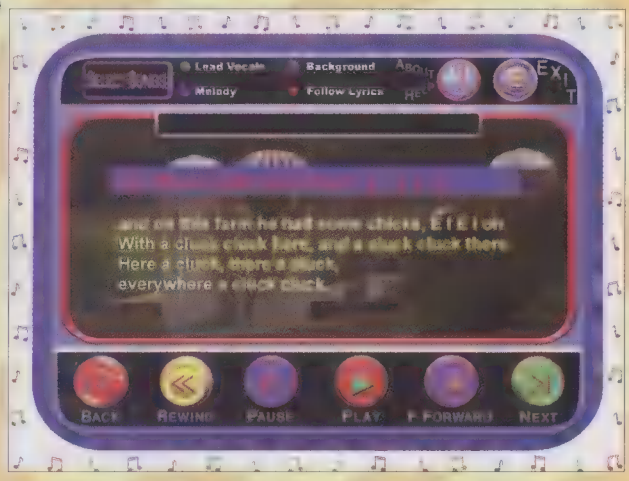

Computer Karaoke's colorful Kids Edition *program is designed for singers aged two through six. The software uses digital audio instead of MIDI to generate the accompaniment, so playback is consistent no matter what computer you use. The tempo can't be changed, however.*

interactivity; based in part on my suggestions, the company has redesigned the user interface. The new version is shown here.) One disquieting note: The graphic for the "Eensie Weensie Spider" (*2–6 Edition*) is a photo of a tarantula — not quite the cuddly image your toddler might expect.

For the singing-impaired, you can toggle the melody on and off; likewise, you can choose to eliminate the background vocals if you've got a bunch of friends ready to doo-wop. The *2–6 Edition* also features a spoken introduction for each song and optional lead vocals to help those tykes who can't read.

Each disc contains ten songs; the kids' collection includes "My Country 'Tis of Thee," "A Whole New World," "It's a Small World," "Twinkle, Twinkle Little Star," and "Zip-a-Dee Doo Dah." One problem I noticed: Tempos on this disc tend toward the downright brisk — certainly faster than many junior chanteuses can manage. Ah, but it's a computer; you can slow them down, right? Nope. Nor can you change the key to match little Spanky's range. Too bad, but it's a price you pay for the increased compatibility of using audio files instead of MIDI. Selections on the adult disc include "Come and Get Your Love," "Kokomo," "The Name Game," and . . . "YMCA."

Should you buy the adult disc? If you're like my friend Jack, who glowered at our happy little performance, this won't change your mind about karaoke. On the other hand, scads of weekend Winonas, Elvi, and virtual Village People can't be wrong. Too bad the package doesn't include a prop mic and some high-heeled sneakers.

What about the *2–6 Edition*? As it stands, I can't see how it's an improvement over a well-produced sing-along tape. Better yet, dial up a screensaver, tune up the old ukulele, and *really* sing with the tykes. Overall, I have to wonder if this disc is appropriate for the age group indicated. It covers a lot of developmental ground; younger kids may not be able to read all the words, and might not relate to the songs the same way older ones do. Over the past 20 years, I've done music workshops and performances for children throughout the U.S. and Europe, and have learned that kids' music, particularly for very young children, is a lot more than scaled-down adult music. —*Mark Nelson*

Contact: Computer Karaoke, 90 S. Newtown Street Rd., Newtown Square, PA 19073; 610-325-4348 or 888-U-SING-IT (874-6448, orders only); fax: 610-325-8840; Web: www.computerkaraoke.com. ***Circle #168 on reader service card.***

PC/Mac

HARMONIC VISION

Music Doodle Pad

($19.95)

Simple utility for composing and playing music.

System Requirements: *Windows 3.1*, 25MHz 386 or better CPU, 4Mb RAM. *Windows 95*: 33MHz 486 or better CPU, 8Mb RAM. 640x480 256-color SVGA, 4Mb free hard disk space, MPC-compatible soundcard. *Mac*: 25MHz 68030 CPU or better, System 7, 5Mb RAM, 4Mb hard drive space, 256-color monitor.

Music Doodle Pad takes a laid-back and simplistic approach to musical composition, opting for fun rather than industrial-strength functionality. Everything in the program is drag-and-drop, which makes it easy for even young composers to use (the product is recommended for ages seven to adult).

While traditional treble and bass clef staves are used, you only get four types of notes: Large, Medium, Small, and Tiny, which correspond to a quarter-note, eighth-note, triplet, and sixteenth-note, respectively. Other durations are created by tying multiple notes together. None of the four note types has a tail, though they do have eyes (and mouths, when they're played).

Musical instrument voices are selected from a sound palette. The six default instrument choices are grand piano, oboe, marimba, trumpet, jazz guitar, and clarinet, but you can use any of the 128 General MIDI instrument voices.

Tempo and volume can be controlled via sliders on the program's main screen, and you can select key signature, enable/disable accidentals, and specify whether the notes will display their names as you place them on the staff.

Alas, while you can route the program's output to an external MIDI synthesizer or tone generator, you can't use a MIDI keyboard or other MIDI device for input; you're limited to dragging and dropping with the mouse.

A selection of 37 sample songs is provided; they're accessed via the Jukebox menu at the top of the screen. Although the jukebox is loaded mainly with classical and traditional favorites, these songs provide a good starting point for editing and learning the structure of how songs are put together.

While Music Doodle Pad departs from traditional notation, input, and compositional standards, it's a fun program to use, particularly for very young children. It provides a non-intimidating starting point for anyone who wants to get involved in music and composition. —*Tom Benford*

Contact: Harmonic Vision, 906 University Pl., Evanston, IL 60201; 800-644-4994 or 847-467-2395; fax: 847-467-3008; e-mail: Maestromax@harmonicvision.com; Web: www.harmonicvision.com. ***Circle #169 on reader service card.***

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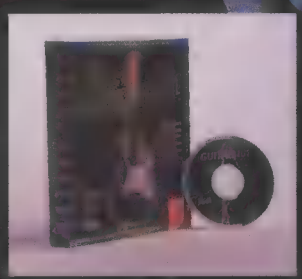

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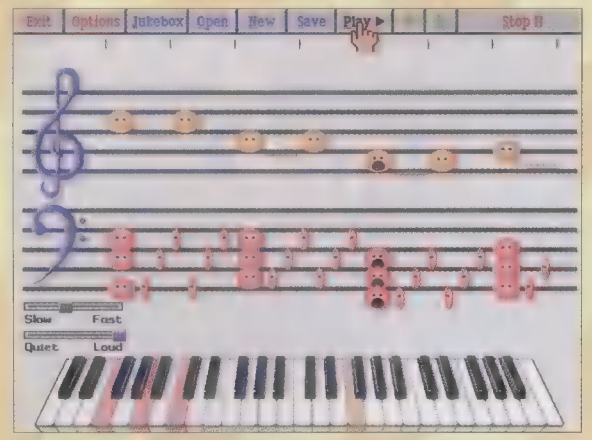

With Music Doodle Pad, you make music by dragging singing notes onto the staff. Note duration corresponds to size; the MIDI sound each note will play is indicated by its color.

PC

HOTZ CORP.

Hotz Trax ($49.95)

Interactive, MIDI-based jamming software.

System Requirements: 66MHz 486 (Pentium recommended), VGA display, 8Mb RAM, 5.5Mb hard disk space, Windows 3.1/95, soundcard, CD-ROM drive, MIDI keyboard (optional).

Ever wanted to play a cool solo along with a song, but felt limited because you have the musical dexterity of a vacuum cleaner? Hotz Trax provides a chance to vent your musical expression, with satisfying results even if you're a beginner.

As you solo over the built-in accompaniment, Hotz Trax remaps the notes you play so that it's impossible to hit a "wrong" note. It also functions as a sequencer, with track-editing options including quantize, transpose, delete, and duplicate.

Each of the 25 MIDI sequences included with the program is coded with information on the chord and scale used at any given moment, so any notes you play on the computer keyboard, mouse, or a MIDI keyboard are constrained to these scales — it's impossible to hit a wrong note. The program itself can also record your playing along with the sequences (with 192 ppq resolution). There are even some editing features, including a surprisingly comprehensive quantization section.

The main screen is pretty cool: There's a mixer with pan (left-right position), level, solo, mute, reverb amount, program select, and "animated flame" activity indicators — the higher the flames lick, the higher the note velocity. A grid shows which tracks contain MIDI data, while the lower row of buttons plays when you drag a mouse across it.

On a computer keyboard, different instruments (which play polyphonically) and MIDI channels are mapped to different keys according to which "scene" you select. The standard translation plays chord notes on five different MIDI channels, using the top four rows of the QWERTY keyboard and the function key row. The number pad outputs chords; play any three numbers simultaneously for a triad.

Some songs contain multiple scenes. For example, one might set up a solo instrument on all the keys, while another assigns solo scale notes on three rows and chord notes on another. This sounds more complicated than it is — select a scene, bash on the keys, and it's obvious how it works. Less obvious are the control keys for momentary and permanent transposition, pitch-bend, and modulation, but the manual and online help (which are well done) explain the finer points.

You can have definite fun jamming from your computer keyboard through a typical soundcard, but using a MIDI controller and quality General MIDI tone generator adds a tremendous amount to the experience — wail on the pitch wheel, play solos on the white keys, and hit chord notes on the black keys. To solo over a non-Hotz tune, load a sequence and start it playing. When you find the appropriate section, hit Pause, then play your keyboard: The computer's MIDI Out will now transmit notes constrained to that particular chord and scale. There's even automation that records mixer snapshots as well as volume, pan, reverb, and patch changes, and you can sync to MIDI clocks. In the future, Hotz expects you'll be able to play along with Hotz-coded CDs as well.

Bottom line: Even if you're a musical moron, you can rock out; yet the program, and the principles behind it, have some serious depth. Compared to the original, full-blown Hotz Translator for the Atari, this is a pretty scaled-down program; but given its consumer-oriented nature, it gets very high marks for instant gratification and value for money. —*Craig Anderton*

Contact: Hotz Corporation, 30343 Canwood St., Ste. 206, Agoura Hills, CA 91301; 888-774-8729 or 818-735-5710; fax: 818-735-5720; e-mail: hotzmail@hotz.com; Web: www.hotz.com. ***Circle #170 on reader service card.***

Mac

INVISION INTERACTIVE

CyberSound Studio

($99; additional CD-ROM instrument library, $39.95)

Software synthesizer/sequencer.

System Requirements: Power Macintosh, System 7.1 or higher, 16Mb RAM, 22–56Mb free hard disk space.

I first saw InVision's CyberSound Studio, then named CyberSound VS, a couple of years ago at a Macworld convention and was immediately drawn in. Here was a program that provided excellent-sounding music voices without needing any external MIDI modules or extra cabling. With this, I thought, even a PowerBook becomes a professional-quality music device. Now that I've had a chance to play with it some, I have some good news and some bad news.

First the good news: CyberSound Studio sounds better than ever. It uses a superb software synthesis engine to produce a full complement of high-quality sound banks, incorporating the General MIDI voices, 17 drum sets, orchestral instruments, and rhythmic loops that will serve creative types well for improvisational and impromptu sessions. 223 instruments in five banks, to be precise. And get this — the package includes a 37-key MIDI controller keyboard and a MIDI interface!

The bad news is that due to circumstances beyond InVision's control (namely, an audio buffer in the Mac that needs to be filled before sound can be sent out of the computer), CyberSound has a noticeable delay when you play notes from an external keyboard. It's not much, but still such that this program would not serve well as the primary compositional system for a professional musician. That being said, one must consider that this package isn't really aimed at professional musicians, although they can certainly make good use of it for MIDI file playback (especially on portable computers) and basic sequencing.

We should also give InVision credit for a monumental engineering job. The sounds aren't stored in ROM banks, as is the case with MIDI modules, but rather are produced through sophisticated synthesis techniques and then stored in RAM, which is also shared with the computer's operating system and the main program. To end with good news, InVision reports that in their tests with a beta version of Macintosh System 8, the delay is almost imperceptible.

CyberSound is very easy to use, providing a basic 16-channel MIDI sequencer with straightforward controls and the usual niceties like transposition, quantization, and velocity editing. And it comes with some impressive MIDI files to start off with, as well as rhythmic loops that can be used for improvisation.

Speaking of improvisation, the program includes a number of MIDI files that are specifically designed for you to jam with. Thanks to an "Input Constrain" feature, you can set your keyboard to play only the notes from, say, the harmonic minor scale in the key of *F#*. I was particularly enthused with this feature, as my keyboard skills are "beginner" at best. With Input Constrain on, and provided I had selected the correct

The $99 CyberSound Studio includes a MIDI keyboard, interface, sequencer, and a software-based synthesizer with one-finger rhythm loops and grooves. The faster your Mac, the more notes you can play simultaneously. By adjusting playback parameters, you can configure the synth for optimum performance on your system.

scale and key, I literally could not play a wrong note.

The Input Constrain feature is especially useful — and fun — when you use the on-screen keyboard. Just glide the mouse over the keys and the notes play, so you can sound like Keith Jarrett in no time. You can also configure the on-screen keyboard to play chords, although you can't switch chord types on the fly the way you can on a MIDI keyboard (or even on the QWERTY keyboard).

Another neat feature is pitch-to-MIDI, which takes microphone input and converts it to MIDI data. The idea here is that you can just hum a song or play it on a guitar, and CyberSound will play those notes on the instrument of your choice. Unfortunately, I couldn't get it to work; tech support told me that at the time of this writing (mid-April), the pitch-to-MIDI function wasn't compatible with operating systems higher than 7.5.3. They're working on a patch, which should be completed by the time you read this. —*John Poultney*

Contact: InVision Interactive, 2445 Faber Pl., Ste. 102, Palo Alto, CA 94303-3316; 800-468-5530 or 415-812-7380; fax: 415-812-7386; e-mail: info@cybersound.com; Web: www.cybersound.com. ***Circle #171 on reader service card.***

PC

JUMP! MUSIC

Song Factory ($49.99)

Automatic music composition & arrangement software.

System Requirements: Windows 3.1/95, 33MHz 386 or better CPU, 8Mb RAM, Sound Blaster-compatible soundcard, 2X CD-ROM drive

Here's an efficient music-making tool: Song Factory lets you mix styles, grooves, moods, instrument sounds, and even automatically generated melodies to quickly throw together MIDI-based soundtracks. The program (an update of Blue Ribbon Soundworks' AudioTracks Professional) presents its features with an interface that does a very good job of making music generation easy and fun.

When you build a song, you select from a fairly limited collection of instrumental arrangements ("high school band," "electric set," etc.) whose names may or may not be terribly descriptive of the actual sound quality (though you can override the default instrument assignments). Next, you pick a mood, like "hopeful," "romantic," or "demented." Tempo and section lengths are also quickly and intuitively set by the user.

Now it's time to add or create a melody line for the song. This is where Song Factory really shines. You can simply draw a melody on a grid, and the program plays each note for you as you click. Drag-and-drop editing lets you refine the melody. This is a very quick and intuitive way of creating melodies that even non-musicians can use. You can also use Song Factory for more traditional

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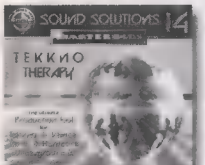
TEKKNO THERAPY



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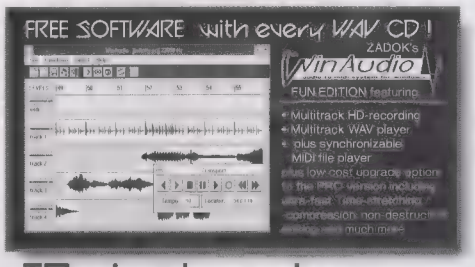

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Look out! This Hit-Kit library (similar to our Rave Trax CD) could be your ticket to the charts. Instant fun with everything you need to produce music in the styles of Rave, Jungle, House and Euro-Tekkno. Complete breakdowns with drumloops and bass- & sequencer lines, gated Chords & matching vocal hooks, give you an easy start for your own creations. Assemble and remix at your hearts content and create great audio backgrounds for your PC applications. Color coded documentation! A must for every rave addict! over 580 MB - only US$ 39.-

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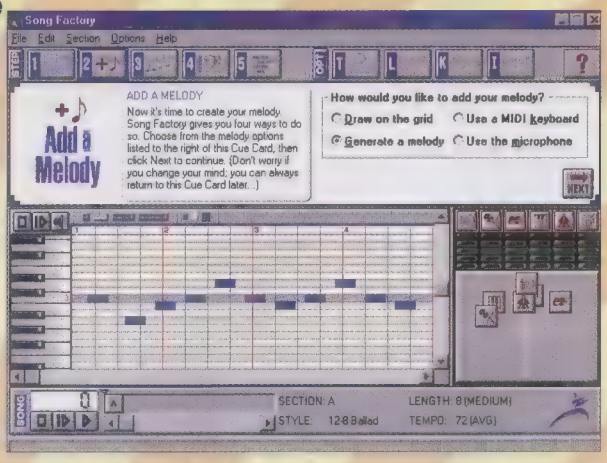
sequencing by opening the Add Melody feature and selecting "Use a MIDI keyboard." You can even enter your melody by plugging the provided microphone into your soundcard and singing into it. Song Factory corrects the pitch and converts it to MIDI data that can drive a synthesizer (although the conversion algorithm occasionally drops notes). If all else fails, the program can compose melodies itself. The final song can be saved as a Standard MIDI File.



Song Factory's innovative mixing window (bottom right) lets you control the level and left-right stereo position of the players in your virtual band: Drag the icons vertically to change volume, horizontally to change position.

I've actually found Song Factory very handy for creating drum tracks for my own music arrangements. I really like this program. It's stunningly easy to use, does a good job of using the Windows 95 interface, offers a good range of features, and puts them in the hands of non-musicians in a way that is both easy and non-condescending. —*Rich Grace*

Contact: Jump! Music, 201 San Antonio Circle, Ste. 172, Mountain View, CA 94040; 415-917-7460; fax: 415-917-7490; e-mail: info@jumpmusic.com; Web: www.jumpmusic.com. ***Circle #172 on reader service card.***

PC/Mac

KEYFAX

Twiddly Bits, Vol. 7 & 8

— *Programmer's Toolkit* & *MIDI Breakbeats* ($34.95 each)

MIDI files of techno-style drum patterns, bass lines, chords, arpeggios, and effects (Vol. 7); breakbeats and jungle-style drum patterns (Vol. 8).

System Requirements: MIDI sequencer that can import Standard MIDI Files, MIDI synthesizer or soundcard.

Problem: You crave those cutting-edge techno and hip-hop tracks, but you don't have the time, bucks, or know-how to make your machines speak the language.

Twiddly Bits to the rescue. By feeding one of these inexpensive floppies to your Mac or PC sequencer, you'll get instant access to a wide range of short musical clips programmed by the masters. Bustin' drum beats, bass lines, chord progressions, and arpeggios — you'll find these and more on *Programmer's Toolkit*. Or if hip-hop-style breakbeats and speed-demon jungle patterns are what you're after, then *MIDI Breakbeats* is worth checking out.

If you've ever imported a MIDI file into a sequencer, you know how easy products like Twiddly Bits are to get up and running with. No fancy installations, no dense owner's manuals to read. Just stick in the disk, launch your sequencer, and import the files. Bingo — you're ready to feed your hungry MIDI modules a mouthful of new grooves.

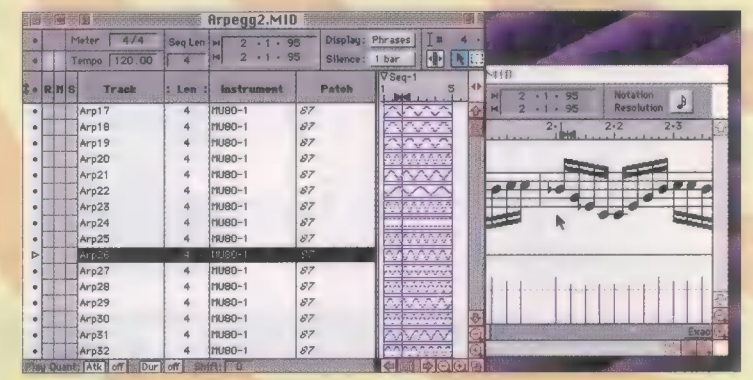
The Twiddly Bits files are compatible with General MIDI, making them even more appealing to instant-gratification types. Both disks also contain data for milking extra expression out of GS and XG modules — NRPNs for achieving filter sweeps, effects tricks, and the like, and, in the case of *Volume 8*, data to tap the layered Dual Drum mode.

The MIDI files on *Programmer's Toolkit* include drum patterns, bass lines, arpeggios, chord progressions, and special effects. The *MIDI Breakbeats* package comes with 400-plus individual drum loops, spanning hip-hop and cutting-edge jungle ("drum 'n' bass") styles. Featured performers and programmers are Al Eaton (Too Short, Ice T), T.E.T. (Anthill Mob, Doug Wimbish), Andres Small (Us3, Swing Out Sister), Shane Meehan (Definition Of Sound, Microgroove), and Keyfax's own Dave Spiers.

The MIDI files on both disks are grouped logically into folders (drum patterns, bass lines, chord progressions, and so on). Open a file, and you'll find a dozen or more short sequences (usually two to four bars long), each assigned to its own track for quick auditioning. Activate your sequencer's "return-to-zero" transport command, and solo the tracks one at a time. If you like what you hear, copy the data into your song file, and from there you can cut, copy, paste, or edit as needed.

How good are the patterns? Darn good. Having used them extensively over the past couple of months, I can assure you that the Twiddly Bits programmers know their stuff. I fooled many listeners into thinking I'd lifted a breakbeat straight from an old LP by using a combination of "popping vinyl" noise from E-mu's Planet Phatt module and a Twiddly Bits drum pattern. Ultimately, though, the results you get will be determined by the module(s) you're using to play the files back on. You're only as good as your weakest link, right?

For less than $35 a pop, I highly recommend both of these disks. And as the subtitles imply, there are several other volumes in the Twiddly Bits product line — each



Arpeggiators are all the rage in techno music, but you don't need to buy a new synth to get those cool patterns. Just load some Standard MIDI Files from Twiddly Bits Volume 7 into your sequencer (here we've used Opcode Studio Vision Pro) and pulsate away. To add some funky MIDI breakbeats, fire up Volume 8.

aimed at a specific musical style. —*Greg Rule*

Contact: Keyfax Software, P.O. Box 958, Aptos, CA 95001-0958; 800-752-7280 or 408-688-4505; fax: 408-689-0102; e-mail: 102045.3065@compuserve.com; Web: www.usgmedia.com/keyfax. ***Circle #173 on reader service card.***

PC

MICROFORUM

New Beat Trancemission

($29.95)

Creates techno/rave music by combining .WAV files.

System Requirements: 66MHz 486 DX or better CPU, Windows 95, 8Mb RAM, 2X CD-ROM drive, soundcard (100MHz Pentium CPU, 16Mb RAM, 4X CD-ROM drive recommended.)

Just when I think there's no compelling reason to have a more powerful computer, along comes a program like Microforum's New Beat Trancemission. The package touts New Beat as "the new rave in PC music creation," and while it's tough to argue with such an objective statement, you certainly can turn your PC into quite an impressive sound machine with this baby.

"Music creation" may be a bit of a misnomer, as you can't use New Beat as a composition tool in the traditional sense. What you can do, however, is put together a palette of looped sounds and mix them at will to recreate the type of hip-hop, trip-hop, dance-ready ambient sound pastiche that kids are dancing to at raves these days.

New Beat is quite easy to use. You have a 20-space grid of hot buttons, each of which starts or stops a sound loop when clicked. You customize this palette by loading any of over 200 sounds (from bass, drum, rhythm, sound effects, and "miscellaneous" categories) into any of the 20 buttons. You can audition the sounds before you load them, so the loading process goes a little faster.

Once you've put together a palette of loops, just click away and they'll start playing, layering one atop another. Click "Record" to save the playback as a .WAV file; you can layer up to four tracks to create detailed songs. The results are really quite impressive for a $29.95 program.

The sounds supplied with the package are predisposed to the "house" music crowd, so if you're so inclined, you'll probably be very satisfied with the included files. I found the program particularly entertaining for improvisational use — just hook up the computer to a high-quality sound system and start playing. Each grid button has a keyboard equivalent, so you can start and stop the sounds directly from your keyboard without needing the mouse.

When you play with New Beat — and this is where my earlier statement of system potency comes into play — it's pretty easy to overload your system by loading too many sounds at once. Up to about eight

layered loops worked pretty well on my system (a Pentium 75 with 32Mb of RAM); after that, the timing suffered. So a faster system with more RAM, as always, is probably the answer.

An auxiliary program called Sound Warp lets you record new sounds through your Sound Blaster-compatible soundcard and then edit them into loops. Sound Warp is rudimentary, but it does let you add simple effects like echo, chorus, pan, and reverse.

Another companion program, Fuse Box, lets you make your own drum patterns from pre-recorded samples. These include favorites like snare, kick drum, hi-hat, and cowbell, as well as "Laser" and "Scratch." Fuse Box won't let you do any fancy business, though — it just gives you 16 possible notes across a one-bar pattern; you can turn these on and off to determine whether the drum plays. Layer as many as you like and import it into the main program.

New Beat is a great deal for $29.95, as long as you accept it for what it is — a fun program suitable for creating semi-original dance music based on pre-made samples. —*John Poultney*

Contact: Microforum, 1 Woodborough Ave., Toronto, Ontario, Canada M6M 5A1; 800-465-2323 or 416-656-6406; fax: 416-656-0548; e-mail: contact@microforum.com; Web: www.microforum.com. ***Circle #174 on reader service card.***

New Beat Trancemission lets you toggle up to 20 looped .WAV files on and off from a QWERTY keyboard, building up a monster mix that can be saved as a new .WAV file. The program comes with over 200 techno samples.

PC

MIXMAN TECHNOLOGIES

Mixman & P-Funk Remix

($29.95 each)

Realtime remixing software with audio samples of hit songs.

System Requirements: *Windows 3.1:* 66MHz 486 CPU, Creative Labs 16-bit soundcard. *Windows 95:* 100MHz 486 CPU, DirectX-compatible soundcard, CD-ROM drive.

Ever wonder how it would feel to be a DJ for one night? The crowd's dancing, the bass is jamming, here comes

Mixman puts 16 looped tracks from hit records under your computer keyboard; you get to bring them in and out, sustain them, or pitch-shift them on the fly. The yellow lights here show that we're holding eight tracks.

Mixman's newest release serves up samples of Parliament/Funkadelic for your remixing pleasure. We'll take George Clinton over a "progress thermometer" any day.

the Mothership. Bring in a skanky guitar line, drop in some congas, a little background chorus — break it down to nothing but the horns, then slam it all back, phat and funky. Your fingers fly across your keyboard, typing out. . . .

Wait a minute. Your keyboard? Typing? What's wrong with this picture?

Absolutely nothing, provided you've picked up either of these hot new CD-ROMs. With only a standard computer keyboard and your own wiggly digits, you can remix the mighty George Clinton and Parliament/Funkadelic. Or Coolio. Or Planet Soul, Groove Connection, or any of a number of contemporary dance artists in the privacy of your own computer. It's even better if you share — dig it, a whole new genre: the Party CD-ROM!

For years, people have been searching for a way to enable non-musicians to make music on a computer. Witness the proliferation of sampling, loops, MOD files, and even MIDI files. Mixman has gone one better: Anyone, regardless of musical experience or ability, can create a happening mix. (It's a tad confusing: Mixman is the name of both the company and one of their CD-ROMs.)

I'll leave a discussion of whether rearranging pre-recorded loops is *really* music to those with the time and the temperament to argue such things. For the rest of us, shut up and dance!

Both CDs work the same: Clicking on a picture of a record jacket selects a song. From there, you can play the artist's mix, exit the program, or navigate to the mix screen.

There's where you'll be spending most of your time. Hit "Play"; a long sample taken from the recording starts to cycle. Select additional tracks, say a skittery hi-hat or a juicy analog synth sweep, by holding down keys on your keyboard — the ones on the left side are mapped to the left turntable; those on the right side to the right. Through some technological magic, anything you select will play perfectly in sync with everything else.

The spacebar locks held tracks so they play continuously. The minus key mutes all locked tracks while letting held tracks play for solo or silence effects. You can instantly pitch-shift tracks up or down with the asterisk key for special effects. You can change the tempo of the whole mess to match your dancin' feet. You can even record your moves and play them back. Or trade 'em with your friends! Like a musical instrument, the software gets better with practice.

Of the two discs, the P-Funk is definitely the most cool. How could you go wrong with the greatest grooves on the planet? Here's a sample: "Flashlight," "Atomic Dog," "Mothership Connection Starchild." Am I alone in thinking we've got the wrong Clinton in the White House?

This is not to slight the Mixman disc. With tracks like "Fantastic Voyage" by Coolio, Planet Soul's "Set U Free," and "Move It Like This" from K7, it's like a rave in a box.

Both discs are great, but the P-Funk Remix disc is outstanding — hands-down the most fun I've ever had with a CD-ROM. The only downside is written in tiny type: Due to copyright restrictions on the source material, the remixes you make "may not be sold, distributed, or performed." Fortunately, Mixman Studio, due this fall, will let you load your own samples and apply the Mixman engine to them. —*Mark Nelson*

Contact: Mixman Technologies, 850 Montgomery St., Ste. 350, San Francisco, CA 94133; 415-403-1380; fax: 415-403-1388; e-mail: info@mixman.com; Web: www.mixman.com. ***Circle #175 on reader service card.***

PC

PFU

Magicbaton ($39.99)

Conduct MIDI files with a mouse.

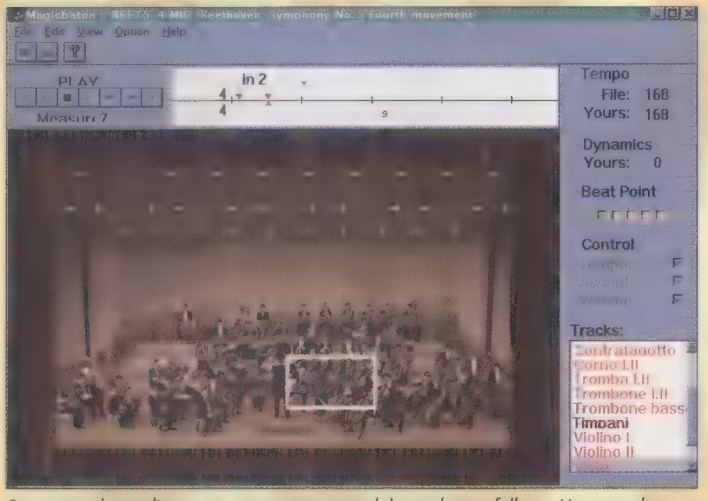
System Requirements: Windows 3.1 or 95, 75MHz 486 DX4 or faster, 16Mb RAM, CD-ROM drive (program can be installed onto your hard drive or run from CD-ROM), 32-note polyphonic sound source (wavetable synthesis soundcard or MIDI interface and GM/GS/XG MIDI sound module).

It's been a long day. You've spent it buried under a pile of paperwork and just want to go home where you can feel like the boss. So you boot up your computer, and suddenly you're transformed into the conductor of your own virtual

orchestra. Crescendos, accelerandos, fermatas — nearly every performance aspect is yours to conduct by moving your mouse.

How is this possible? Magicbaton is a MIDI file player that gives you realtime control over a variety of MIDI parameters like note velocity, volume, and tempo. Holding down the shift key while moving your mouse over images of an orchestra sends MIDI messages to affect these parameters, letting you "conduct" the MIDI playback. You can record your conducting performance and listen to the results. The original music file and your changes can be saved into a new MIDI file for you to play and conduct as many times as you'd like.

A library of well-known orchestral works like Mozart's *The Marriage of Figaro* and Rossini's *William Tell Overture* is included (seven overtures and five symphonies in all), but you can open and conduct any MIDI file. The included files, for the most part, are quite nice. String-section emulations are programmed well, but the drum and cymbal rolls detract from the general musicality of the files and, in some cases, steal notes from other instruments that play at the same time.



Step up to the podium, wave your mouse, and the orchestra follows. You can also use Magicbaton to add expression to your own MIDI files.

When you conduct with Magicbaton, you can control how loud and accented the music is by the size of your stroke — the larger the stroke, the louder and more accented the music. Tempo is controlled by how fast you move the mouse. You can select any combination of these three performance characteristics to control, which is a clever way to add just the right amount of expression to your MIDI tracks. Fermatas (holds) and breath marks can be inserted into the music to give it more realism.

Two views, Rehearsal and Concert, are available from the view menu. In Rehearsal mode, the entire orchestra is visible onscreen. When you click on sections of the orchestra (the trombones, for example) a box appears around them and the section name on the right side of the screen becomes highlighted. The dynamics (volume and accents) that you apply will only affect these sections. In Concert view, still images of various instrument sections are displayed in slide-show style. For example, when a flute solo is being played, you will see a picture of the flute section. You can pick images from a library to appear at any point in the music.

There's a slight learning curve to conducting with a mouse, but alternate mouse controllers such as the GyroPoint (manufactured by Gyration, 408-255-3016) let you conduct in a more traditional manner by creating strokes in the air. According to the manufacturer, the music/theater department at the University of Victoria (Canada) is using Magicbaton with a GyroPoint to conduct concert performances using live singers and MIDI accompaniments.

Tune up the orchestra and take it from the top. Magicbaton is fun to use with the included files, or as an alternate controller for tweaking your MIDI tracks. —*John Krogh*

Contact: PFU, 226 Airport Pkwy., Ste. 430, San Jose, CA 95110; 408-453-7290; fax: 408-453-7291; e-mail: magicbaton@pfuca.com; Web: www.swan.or.jp/magicbaton. ***Circle #176 on reader service card.***

PC

ROLAND

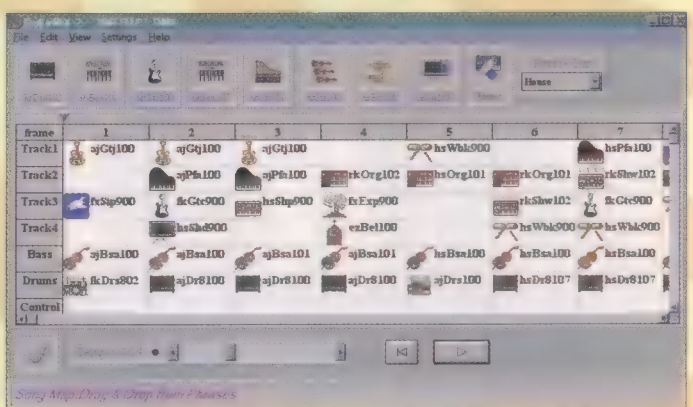
DoReMix 2.0 ($88)

MIDI-based song arrangement program.

System Requirements: Windows 3.1, soundcard or external MIDI synthesizer and MIDI interface

When I first booted up Roland's DoReMix, I was reminded of "magnetic poetry," those tiny magnets with words on them that you can arrange to make phrases and sentences on the fridge. No paper or pencil necessary, just grab some words and let the creative juices flow.

DoReMix is the musical equivalent of this poetry; its four-bar MIDI files, called *phrases*, can be dragged and dropped into a spreadsheet-style window called a *song map* to create your own arrangements. The results can be saved as Standard MIDI Files, so you can import them into full-fledged MIDI sequencers and tweak them further. Using DoReMix, you can create music on your computer without needing a professional (read "steep learning curve") MIDI sequencer, or spending years learning to read music. No musical



Drag and bop: With Roland's DoReMix, you create music by dragging four-bar phrases onto six parallel time lines. The result can be saved as a MIDI file.

experience is required at all, which should make this handy music production tool appealing to songwriters and multimedia artists alike.

Each cell in the song map is called a *frame;* it will hold one four-bar phrase. You select musical phrases from the "Phrase Table" located at the top of the screen. The eight Phrase icons represent your virtual band instruments and include everything from piano, bass, and drums to gunshots, sitar, and helicopters. There are six tracks that phrases can be dragged into, although two tracks are restricted to bass and drum phrases. The remaining four tracks are wide open for you to fill with any number and style of phrases. Styles include rock, jazz, classical melodies (orchestral excerpts of familiar works from such composers as Brahms and Mozart), house, and so on.

Two buttons, Play and Rewind, are the only shuttle controls you'll find in DoReMix. Nearly every other playback operation is available by double-clicking in the program's remarkably simple and flexible point-and-click interface. Want to hear one of the phrases from the Phrase Table? Double-click on it. Want to hear every phrase within one frame? Double-click above the frame. You get the idea.

A mixer window lets you set reverb amount, chorus amount, and volume for each track on a frame-by-frame basis. Additionally, each frame can be faded in or out, which is especially important because ending phrases aren't provided with the program. Unfortunately, fades in DoReMix are created by sending Sys-Ex Master Volume messages, which some synths and soundcards — including the ubiquitous AWE32 — don't respond to. This means that if you're using such a MIDI device and want fades, you'll have to import your arrangement into a sequencer and create volume changes using Controller #7.

For multimedia artists, jingle writers, and non-musicians as well, DoReMix offers enticing capabilities for creating music quickly. There are plenty of phrases to cover most commercial needs. (My favorites are the house drum grooves.) You can't enter chords to control the harmonic motion of your music, which is good and bad: Having this capability would raise the level of musical skill required to use this program. On the flip side, competitors such as PG Music's Band-in-a-Box offer much more control over your music for the same price as DoReMix. The bottom line is that DoReMix is easy to use, sounds good, and most of all, it's fun. —*John Krogh*

Contact: Edirol, 808 Harrison Ave., Ste. 2020, Blaine, WA 98231; 800-380-2580 or 360-332-4211; fax: 360-332-4405; e-mail: edirol@edirol.com; Web: www.edirol.com. ***Circle #177 on reader service card.***

PC

SOUND FACTORY

Song Construction Kit ($69.95).

.WAV files of musical phrases plus audio editing software.

System Requirements: 386 CPU (486 DX recommended), VGA display, 4Mb RAM, 5Mb hard disk space, Windows 3.1/95/NT, soundcard, CD-ROM drive, fast hard drive for temporary file storage.

Fun Music Software

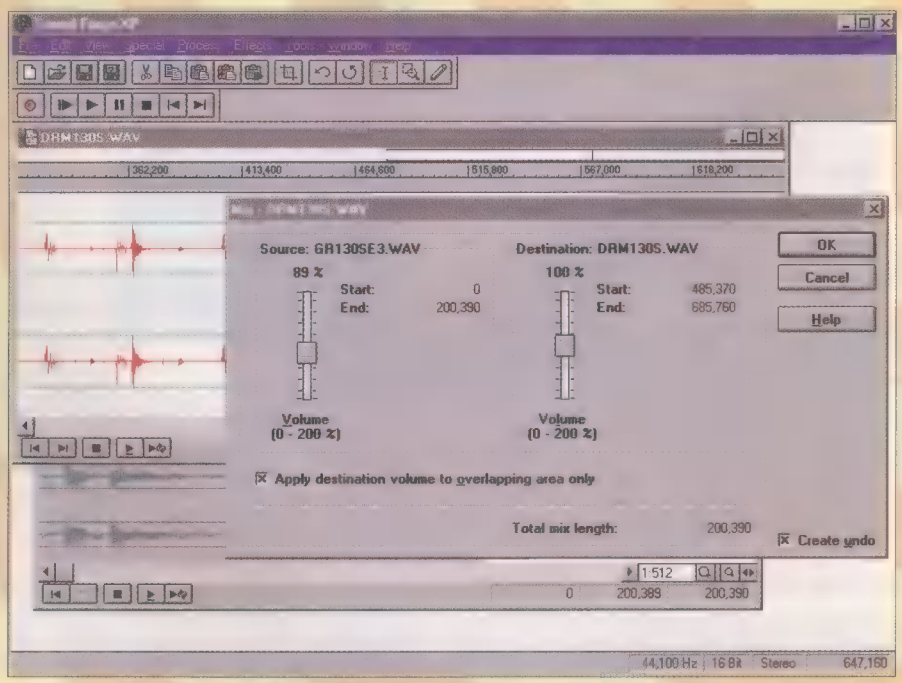
Your mission: Build songs by copying, pasting, and mixing bits of digital audio. Your tools: a floppy disk with Sound Forge XP (a Windows digital audio editing program), and two PC/Mac-compatible CD-ROMs with 575 megabytes of 16-bit, 44.1kHz .WAV files. Your options: Choose audio files from several genres (rock, rap, grunge, dance, blues, country, funk, and "basic" — sort of generic pop). These range from bits of individual instruments (*e.g.*, guitar, bass, drum, keyboards, percussion, and vocal effects) to "demo" tracks where multiple instruments play simultaneously. Your escape route: You can also record your own parts and throw them into the mix.

So much for mission basics. While files within particular genres are musically compatible, some of the most fun occurs by mixing genres, like putting the rap guitar solo on the rock rhythm part. If appropriate, file names incorporate the tempo, which simplifies the matching process.

Sound Forge XP, based on the pro-level Sound Forge, is a very capable 2-track editing program. However, the lack of multitrack editing necessitates a somewhat tedious process of copying and mixing. You build up sections by premixing into two tracks; if you blow a premix, you can undo immediately afterward, but once you accept a premix, there's no turning back. One major plus: Sound Forge XP is loaded with processing options for creative sound mutation. For example, while most sounds are (thankfully!) presented "dry," a trip to the reverb menu can wet things down.

Regarding the music files, the guitar playing is solid but the bass/drum timing tends to be a bit sloppy, and there are occasional "clams." Each musical selection stays pretty much on the tonic, which makes it easy to mix 'n' match different files. The downside is that you can't create any kind of chord progression without using extreme amounts of pitch-shift and time compression/expansion, which adds a warbling, artificial sound quality. In any event, the Sound Factory Web site has information on additional sound files, and hopefully alternate intervals will be made available.

Overall, the concept is great: Fill up some CDs with .WAV files, and paste 'em around until you have something you like. But Sound Forge XP, while superb for 2-track audio editing, is not the perfect fit for this application. Also, the music tracks generally need to be tighter and more carefully mixed. Once these issues are under control, Song Construction Kit could be a very happening product. —*Craig Anderton*



Song Construction Kit comes with a CD-ROM full of .WAV files and the audio editing program Sound Forge XP to help you assemble them. Here a stereo drum track (the red waveforms) is being mixed with a guitar track (the green waveforms).

Contact: The Sound Factory, 9145 Brightleaf Pl., Charlotte, NC 28269; 888-598-4322 or 704-598-4322; fax: 704-598-0627; e-mail: soundfactory@compuserve.com; Web: www.thesoundfactory.com. ***Circle #178 on reader service card.***

PC

VOYETRA

Jammin' Keys

($19.95)

An easy way to create and play MIDI music.

System Requirements: Windows 3.1 or 95, 66MHz 486 or better CPU, 8Mb RAM, 640x480 256-color SVGA monitor, 1Mb free hard disk space, 2X or faster CD-ROM drive, Windows-compatible 16-bit soundcard with MIDI synthesizer.

How would you like to create great-sounding songs, even if your musical skill is, shall we say, lacking? I don't mean rinky-dinky "Chopsticks"-type ditties, but tunes that move and groove and make you want to get up and shake your booty. If this appeals to you, then you're gonna love Jammin' Keys.

To start jammin', you simply select an accompaniment style and press the intro/ending button. Twelve accompaniment styles, each with four variations, are provided, so there's lots of fertile ground — or more correctly, background — to build upon. The accompaniments are provided by a five-part MIDI "band" consisting of drums, bass, rhythm, keyboard, and lead parts. Jammin' Keys creates an intro and starts playing the background tracks. The styles and variations can be changed at any time while the accompaniment is playing, which further broadens the creative possibilities.

The key of the accompaniment can be changed by clicking on any of the keys in the first octave of the keyboard. The remaining two octaves can be used for improvising or playing a melody. You can

change the sound of your lead instrument at any time by clicking one of the instrument buttons at the top of the screen. The first nine of these buttons have pre-selected instruments, but the tenth can be set to select any instrument you desire.

If you're having trouble with your improvisation or you just don't feel particularly creative, Jammin' Keys' "autojam" feature can come to the rescue. Click its button, press any key in the middle octave, and the program will play a new riff each time you press a new key. By clicking a box in the "jam grid," you can change things quickly: The vertical axis changes the accompaniment's pitch, while the horizontal axis selects a new autojam riff.

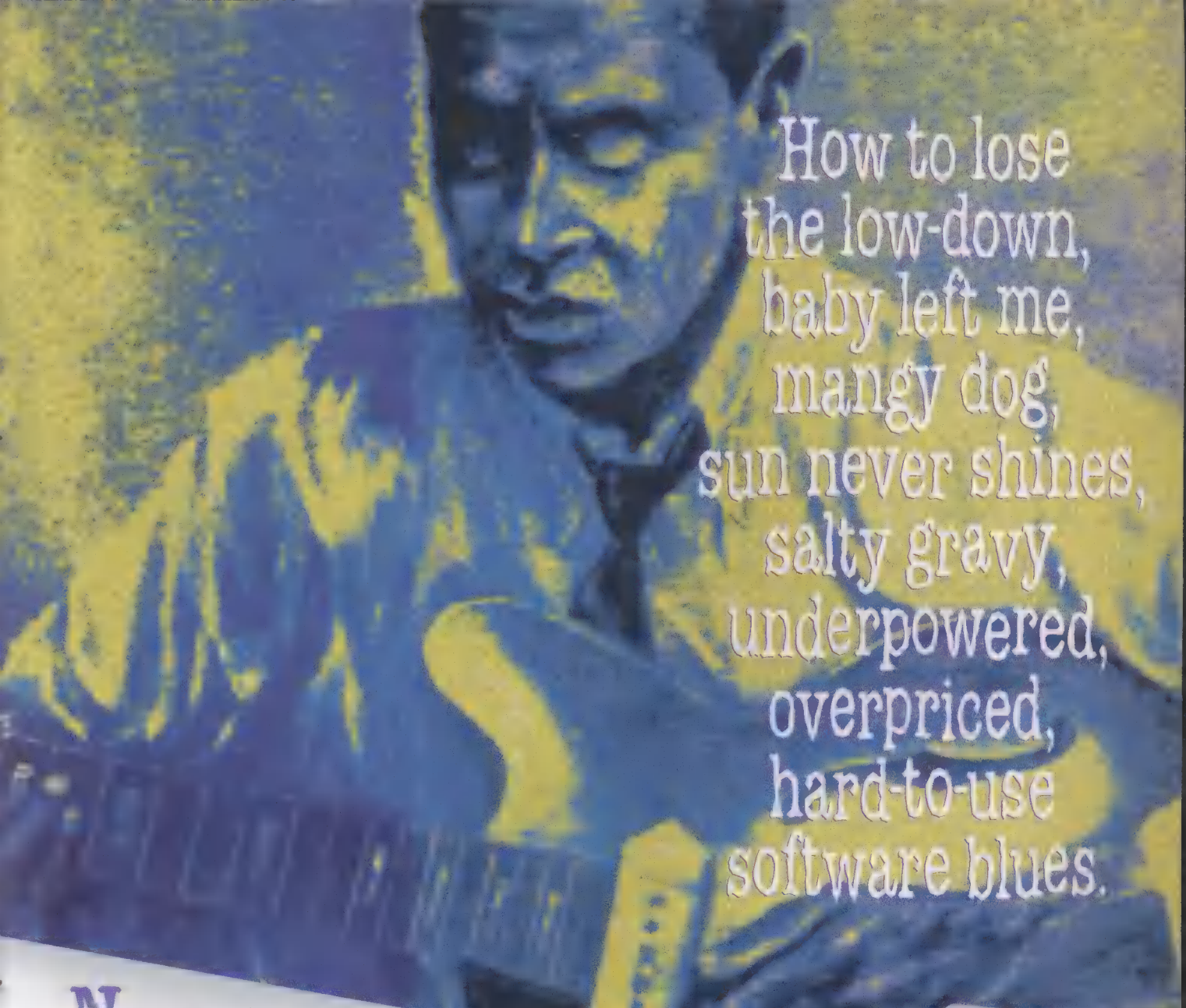
A set of seven hexagonal Effects Pads is used to play effects or drum sounds. Jammin' Keys includes a set of sounds to get you started, but you can also program any pad to play a .WAV file, so you can add phrases, finger-pops, or just about any other sound you want to your jam sessions. It's best to stick with brief sounds, however, since long sound effects can bog down playback.

No, the coffee-cup button (lower left) doesn't trigger a slurping sound; it tells the backup band to play a break. (For sound effects, press the hexagonal pads to the right.) By clicking a box in the "jam grid," you can simultaneously select a new riff and transpose the accompaniment to a new key.

You can use a MIDI keyboard to input your leads and improvisations, and also route the program's output through an external MIDI synthesizer. The built-in sequencer lets you record, save, and play back your jammed compositions, too.

Jammin' Keys gives you lots of creative options, a great range of improvisational features, instant results even if you have a tin ear, and the ability to create MIDI files from your compositions for further processing with sequencing software. What's not to love? —*Tom Benford*

Contact: Voyetra Technologies, 5 Odell Plaza, Yonkers, NY 10701-1406; 914-966-0600; fax: 914-966-1102; e-mail: info@voyetra.com; Web: www.voyetra.com. ***Circle #179 on reader service card.***



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Mozart, Symphony No.41 in C Major, "Jupiter", K551

Beethoven, Symphony No. 5 in c minor, op.67

Dvorak, Symphony No. 9 in e minor, "From the New World", op.95

Tchaikovsky, Symphony No. 5 in e minor, op.64

Mozart, The Marriage of Figaro Overture

Weber, The Free-Shooter Overture

Suppe, Light Cavalry Overture

Nicolai, The Merry Wives of Windsor Overture

Rossini, The Barber of Seville Overture

Rossini, William Tell Overture

Verdi, The Force of Destiny Overture

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System Requirements

Microsoft® Windows® 3.1 or Windows® 95 operating system with i486™ DX4(75MHz) or more, 16MB or more memory, CD-ROM drive, mouse, keyboard, headphone or speaker, VGA display and MIDI interface + external MIDI sound source module (GM/GS/XG) or Wavetable synthesizer compatible audio board (32 voices or more recommended)

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READER SERVICE NO. 122

Emagic Logic Audio

Integrated Audio Recorder/ MIDI Sequencer (PC, Mac)

by Jim Aikin

Some product names hit you right between the eyes, and some leave you scratching your head. (Like, what's a Lexus?) Logic, the high-end MIDI sequencer from Emagic, has exactly the right name — elegantly clear, but a bit intimidating. It conjures visions of Mr. Spock on the original *Star Trek*. While Spock was endowed with astonishing powers, he sometimes frustrated his fellow officers by being a bit lost in the mushy world of human feelings. "But Doctor," he would protest, "that is illogical." At those moments, you couldn't be sure whether he was a step ahead of everybody else, or a step behind.

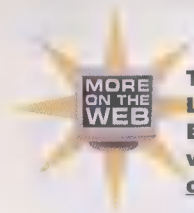
That's Logic for you. Logic Audio is among the best examples of a new breed of music software, the integrated MIDI sequencer/digital audio recorder. This type of program handles both traditional MIDI sequencing and digital audio recording entirely within the computer; the audio side uses the computer's hard drive as a storage medium. (For more on the reasons this technology has become so popular, see "Studio in a Box" on page 42.) If you don't need the audio recording capability, you can buy just plain Logic for $300 less. Since the two programs are identical except for the audio features, in the following pages we'll refer to them both as Logic.

As a high-end program, Logic is feature-rich but sometimes dauntingly complex. In this article, we'll examine its design — sometimes with a critical eye — and explain some of the concepts *behind* the design. If you're new to this type of recording platform, don't be intimidated. As it says in great big capital letters on page 1 of the Logic manual, DON'T PANIC! Even if it turns out that a simpler and less expensive program is more in keeping with your needs, a friendly tour of Logic's features may help you clarify what those needs actually are.

Like its chief rival, Steinberg's Cubase, Logic hails from Germany. And both Emagic's predecessor (a company called C-Lab) and Steinberg started out in the early days of MIDI with sequencers for the Atari ST computer. Today, both Cubase and Logic are solidly multi-platform on the PC and the Mac. (In this article, we'll be talking strictly about Logic version 2.5.4 for the PC; on the Mac side, version 2.6 has been out for several months now.)

Another similarity: Both Logic and Cubase make use of a hardware copy-protect key that attaches to the rear of the PC — in Logic's case, to one of the COM ports. Both support soundcard audio, but currently *all* versions of Cubase provide some audio recording, while Logic only does audio if you buy Logic Audio or Logic Audio Discovery. At the moment, the PC version of Logic is fully 32-bit, Windows 95 native, while Cubase still runs under either Windows 3.1 or Win95. Emagic is scrambling to keep their edge: At last January's NAMM show, they introduced a PCI-bus hardware audio interface, the Audiowerk8, that will provide Logic Audio with up to 24 tracks of native audio through two inputs and eight outputs.

The Audiowerk was not available in time for this review, which is being written in early April. Logic Audio is supposed to work with any full-duplex Windows soundcard, but it crashed consistently when I tried to use it with the MWave card in my IBM Aptiva PC. It worked much better with a Pinnacle Multisound from Turtle Beach — but the Pinnacle didn't much like the MWave either. (The MWave was a problem all the way around, but I was reluctant to remove it from my PC because it has the modem hardware on it. If you can avoid buying a "multimedia PC" with this type of integrated hardware "solution," do so.) With a standard soundcard, Logic Audio will record two tracks of audio at once. The number of audio tracks it will play back is dependent on your RAM and processor speed; on my 166MHz Pentium, the program can handle eight tracks at once. According to Emagic, version 2.6 will play 16 audio tracks on my computer. In either case, the program plays multiple tracks by mixing them to a stereo pair at the audio output.



To learn more about Logic's notation and Environment features, visit www.music-and-computers.com.

Overview. As a high-end sequencer, Logic has all of the standard features and then some. There's a track screen (called the Arrange window) where you can drag chunks of music data around. Slick quantization commands let you tailor the rhythmic feel of the MIDI tracks. A super-high clock resolution of 960 ppq (pulses per quarter-note) provides faithful MIDI playback. With the onboard DSP (digital

PHOTOGRAPH: PAUL HAGGARD

signal processing), you can tweak your audio tracks in numerous ways. There's even a built-in MIDI arpeggiator and a one-finger chord memorizer. The editing environments include a piano-roll window, a graphic controller window, an event list, and logical event-selection filters. And just about every type of operation can be taken care of without interrupting playback.

Logic has many more features than we have space to discuss, even in a large feature article. Buried deep within the program, for instance, is an engine called the Environment. The Environment contains on-screen data sliders, which are used for MIDI-controlled mixing, much as in any other program. It also contains things that you're unlikely to see on another sequencer, such as keyboard splitters and MIDI delays. The Environment is not only powerful, it's fairly intimidating. If your musical needs are simple, you never need to interact with this part of the program at all, but the power is there when you need it. If you're curious to know more about realtime MIDI processing in the Environment, check www.music-and-computers.com.

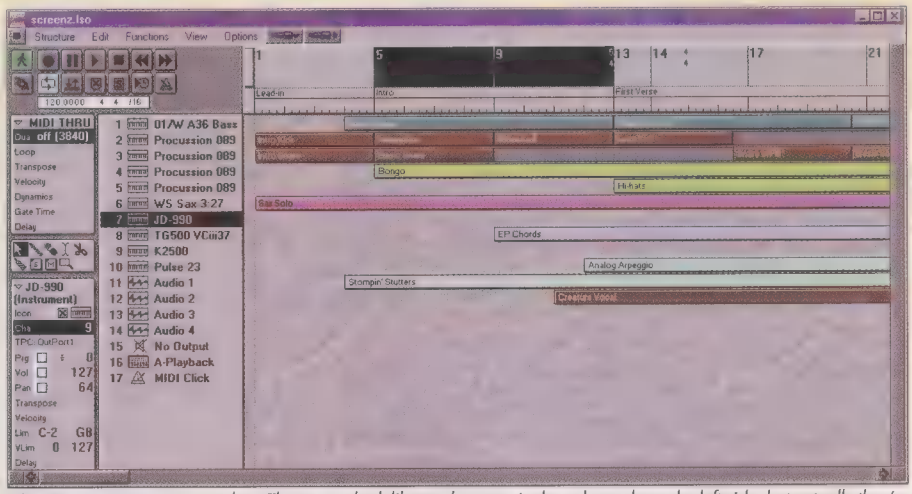


Fig. 1. *Logic's Arrange window. Those may look like track names in the column down the left side, but actually they're "instrument" names. Strangely for such a feature-laden program, Logic 2.5.4 doesn't support track names at all; they're being added in version 2.6. In Logic, each of the data blocks in the main part of the window is called a sequence. The boxes at the far left display parameters for the currently selected instrument and sequence. The gray bars to the right of certain sequences indicate that they will loop during playback.*

Note the telescope icons (used for zooming in and out), the named markers in the ruler at the top, and the tool box between the parameter boxes. You can assign one tool to the left mouse button and another to the right, and then switch between the two buttons as needed. Bars 5 through 13 are in cycle mode, which means they will repeat when playback is started.

If you like editing your music in standard notation, or if you need to print out parts and scores, you'll find Logic's notation features a real pleasure to use. While it isn't as powerful in this department as a full-bore notation program like Coda Finale, it has numerous handy widgets: stretchable S-shaped slurs, alternate noteheads for percussion parts, intelligent chord symbols, automatic multi-bar rests, and much more. It's also a lot easier to use than Finale, though there are a few features that are less than obvious on the surface. For more on the notation side of the program, as well as for some comments on details of the program that we didn't have space for in these pages, again, visit *M&C*'s Web site.

Logic's manual is a very thick loose-leaf binder for documentation — much preferable to a thick paperback, in my opinion. For the most part, the manual is thorough, clearly written, and helpful, though here and there I spotted operations that don't work as described. Also, some of the manual's explanations use special Logic terms without defining them or providing cross-references. The definition may be 50 pages away, and not included in the index. It's up to you to track it down. The online help, sad to say, is pretty wimpy.

The Arrange Window. While developing a song, you'll spend much of your time in Logic's Arrange window (see Figure 1). This looks much like the equivalent window in almost any modern sequencer: Track names and parameters are arrayed along the left edge, and the main body of the window is occupied by rectangular blocks that represent the areas where music data has been recorded. In Logic, these blocks are called *sequences*, which is a little confusing if you're used to thinking of your entire song as a sequence; in other programs, similar objects may be called parts or chunks, for instance. A single Logic song may have dozens or even hundreds of sequences on dozens of tracks, all of them being used to create one song arrangement. In the Arrange window, audio sequences sit side by side with their MIDI counterparts.

Another type of Arrange window object is the *folder*. Like its namesake on the computer desktop, a folder is a higher-level object that contains lower-level objects. In this case, it contains sequences. You can tuck a sequence into a folder by dragging it there with the mouse, open up a folder to display its contents in another Arrange window, or unpack it so that its contents are distributed to other tracks in the main Arrange window.

The Logic Family

SUGGESTED RETAIL PRICE

Logic Audio ($699), Logic ($399), Logic Audio Discovery ($299), Micro Logic ($99).

CONTACT

Emagic, 13348 Grass Valley Ave., Bldg. C, Ste. 100, Grass Valley, CA 95945; 916-477-1051; fax: 916-477-1052; Web: www.emagicusa.com.

PROS

Powerful editing facilities for MIDI and audio. User-configurable screen layouts and keyboard commands. Realtime MIDI processing. Quantization is always undoable. Excellent score printing.

CONS

Steep learning curve. Copy-protected. Audio level and pan automation is unusable. No "redo" command.

BOTTOM LINE

If you're ready to get serious about sequencing, Logic will deliver.

Folders do more than reduce visual clutter. They also allow you to organize your song data. For instance, if you've composed a riff using a drum sequence, a bass sequence, and an electric piano sequence, you can pack the three of them into a folder and then copy the folder as many times as you need. If you later find that you need to edit the drum sequence, your edits will be automatically transferred to every point in the song where that folder is used. Or you could create a single folder called "chorus," containing all of the MIDI sequences for the chorus of your song. If you later decide to add eight bars to the verse, you can grab the chorus and drag it eight bars to the right in a single easy operation. (Logic's audio sequences can't be placed in folders, unfortunately.)

Each sequence has its own set of playback parameters. With these, you can do tricks like nudge the playback time forward or backward in very small increments to get a tighter rhythmic alignment, compress the MIDI velocity data for a smoother or more accented phrase, or transpose the pitch of the sequence up or down. (See Figure 2.) Each sequence can be quantized separately — and quantization in Logic is "playback-only," which means it's always undoable.

Sequences can be individually muted, drag-copied, and snipped apart with a scissors tool or merged with a glue tool. Also, each sequence can be individually looped. By looping your drum and bass sequences, you can quickly extend a two-bar riff so that it plays for 16 or 32 bars, or let it loop indefinitely while you improvise a lengthy solo.

For rehearsal, another type of looping is provided. When you activate "cycle" playback, the arrangement plays from the start of the cycle region to the end; the playback position then jumps back to the start, and the cycle repeats. Logic gives you several ways of setting up your cycle. The easiest is to drag the mouse along the time ruler at the top of the Arrange window. Cycling can also be used in conjunction with punch-in recording (see page 48).

Logic doesn't let you choose a MIDI Program Change message (see sidebar below) to apply to the start of an individual sequence. Instead, Program Changes are attributes of "instruments." There is always one and only one instrument assigned to a given track. This is a less convenient design than what you'll find in many sequencers, for reasons that would take pages to explain. It works well enough if you have a small MIDI rig (one or two multitimbral modules) or a very large one, because in either case you're likely to assign one and only one Program Change to each MIDI channel in a given song. Folks in the midrange, with six or eight synths, are more likely to have to resort to a workaround to set up their Program Change assignments. If you set your song up correctly, Logic will "chase" the correct Program Change when you start playback from a point in the middle of the song. To do this, however, you have to insert Program Changes as data within the sequence(s) on a single track. This sort of defeats the logic of Logic, because you now have an "instrument" whose definition has been rendered redundant by the song data.

Working Logically. Getting around in Logic is both easier and more difficult than on some other sequencers. Let's look at the good stuff first.

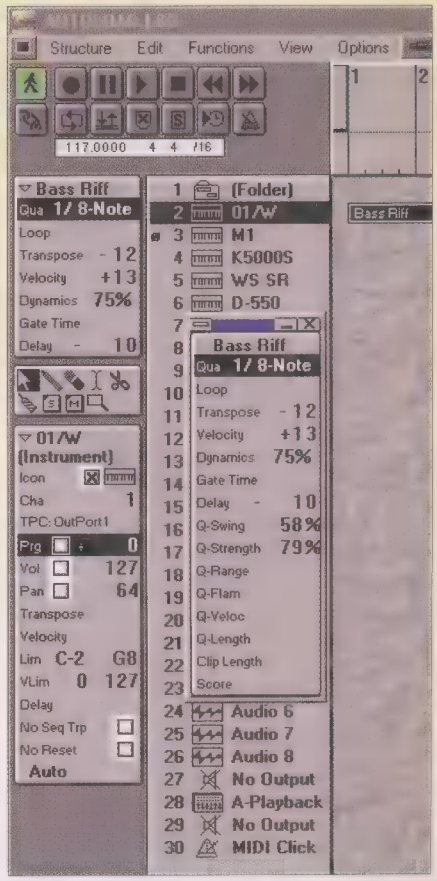


Fig. 2. *Logic provides parameters for both "sequences" (blocks of MIDI data) and "instruments" (MIDI output destinations, which are assigned to tracks). Here, the Bass Riff sequence has been given transposition and delay settings, among other things; the floating "Extended Parameter box," which covers tracks 7 through 23, has more quantization settings. Note that in Logic, the metronome (called "MIDI Click") must be assigned to a track in order to sound.*

Like many modern sequencers, Logic provides a number of different types of windows, each of which is used for certain special tasks. In addition to the Arrange window, there's the Hyper Edit (graphic controller) window, the Event List window, the Matrix (piano roll) window, the Score Edit window, the Audio window, the Marker Text window, the Key Commands window, and the Environment window, plus probably a couple of others I'm forgetting. In some situations, there can be several instances of each type open at once. For example, you could view both your main Arrange window, which contains your song, and two subsidiary Arrange windows, each of which displays the contents of one of the folders being used in the song. (And zooming in on the Arrange window lets you do limited graphic controller editing without

What Is a MIDI Program Change?

A MIDI Program Change is a type of message that tells the receiving synthesizer to switch to a new sound program (also called a preset, patch, voice, or tone). MIDI defines a range of 128 Program Change messages, usually numbered from 0 to 127 — but these are just numbers. Program 83 might sound like a flute on one synth and like a tambourine on another. The General MIDI standard goes further. It assigns a specific type of sound, such as violin or brass section, to each of the 128 numbers. For more on Program Changes, see the Mysteries of MIDI column in the Jan/Feb '96 M&C.

switching to the Hyper Edit window. See Figure 3.) All of the windows will scroll during playback so that the current position in the song remains in view.

The various windows are dynamically linked, so any edits you make in one are reflected immediately in the others. An even better feature is the 90 "screensets." A screenset is a buffer that stores a layout of the screen. Using the number keys, you can recall with one or two keystrokes a variety of working layouts suited to different tasks. For instance, you could have the Arrange window filling the screen in screenset 1, an Event List and the Score Edit window in screenset 2, and a Hyper Edit window with an Environment containing graphic faders in screenset 3. Switching screensets with a single key is much quicker than opening and closing windows.

Another top-notch feature is the large set of user-definable key commands. You can choose your own QWERTY keyboard mnemonics (or, if you prefer, MIDI command keys) for several hundred different actions — opening the Matrix window, starting cycled playback, optimizing audio files, deleting markers, and so on. If you're used to using a sequencer that has a somewhat different (and fixed) keyboard command layout than Logic, you can customize Logic, to an extent, so that it works the way you're used to. You might want to open the Event List with the "E" key, for instance, and the Score window with the "S" key.

As great as this implementation is, it isn't as powerful as it could be. Currently the program doesn't let you create "macro" keys, in which a single keystroke performs multiple actions — but that's not a flaw, it's just a concept for the future. Here's the flaw: Most key commands only work in the currently "fronted" (active) window. For example, let's say you've assigned "M" to open the Matrix edit window. You've recently stopped playback with the mouse by clicking the Stop button in the Transport. As a result, it is the active window. You'd like to edit the sequence called "Hot Lead Licks," and you can see that this sequence is currently selected in the Arrange window. So you hit the "M" key. And nothing happens. Why? Because the transport is the active

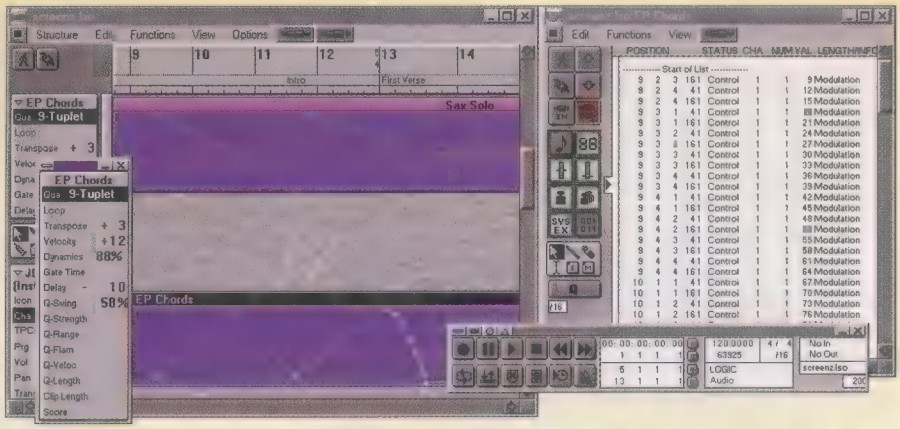


Fig. 3. *Zoom in far enough in the Arrange window and you'll be able to use the Hyper Draw feature. This lets you use the mouse to insert graphic contours for Control Change events such as volume, pan, and modulation. The same types of events can be added with still greater control in the Hyper Edit window (see Figure 4 on page 44). The modulation data that has been added to the EP Chords sequence is shown at right in the Event List window, which has been zoomed out to display as much information as possible in a narrow space. Also shown here are the transport bar and the floating Extended Parameter box for the EP Chords sequence.*

Studio in a Box

Someday soon, we'll be able to switch on a PC and have a complete recording studio at our fingertips. That day hasn't quite arrived yet, but we're sneaking up on it.

Consider this scenario: You're a songwriter. You like to chew on a pencil, scribble strangely evocative phrases, and then strum a guitar or keyboard while moaning like a lost calf. With a MIDI sequencer and a couple of synthesizers, you can do a very effective arrangement of your backing tracks — bass, drums, soaring strings, and all the rest. But now comes the hard part: How do you record the vocal?

With a traditional MIDI sequencer, there was no graceful answer to this question. If you also had a multitrack tape deck, you could record the audio output of the MIDI instruments through a mixer and onto a stereo submix on tracks 1 and 2 of the tape, and then overdub the vocal (plus a guitar solo or whatever) to the remaining tape tracks. But what if, after laying down the perfect vocal take, you decided that the MIDI parts needed to be fixed up a little? *Major* headache. You can go back to the sequencer and edit certain MIDI parts, but when you re-record the submix to tape, it's almost bound to be out of sync with the vocal — either way ahead of the vocal, or way behind it. Synchronizing the sequencer to tape requires extra hardware and extra know-how.

Computer hard-disk recording systems don't really offer an effective solution. They only replace the tape deck. They provide important features like error-free cut-and-paste editing that you won't find in the world of tape, but the creative process is still a one-way street. Do the MIDI tracks first, and then add the vocals and other instruments. And since when was creativity a one-way street?

A new generation of music software has evolved to make life easier for songwriters and anybody else who needs to combine MIDI and audio recording. These hybrid programs are known by various unwieldy names: MIDI/audio sequencer/recorders, for instance. Whatever you call it, an integrated recorder program presents audio tracks and MIDI tracks side by side. The audio is recorded in digital form to the computer's hard drive, and plays back through a soundcard or equivalent. The MIDI data is played back by the synthesizers.

Because the two types of musical material are in the same environment, they can be edited in many of the same ways. (There are still major differences between MIDI and audio; see "MIDI vs. Audio" on page 46.) If you decide to add eight bars to the intro, you can grab all of the track data with the mouse and drag it to the right. The data will all "snap" to the measure/beat ruler at the top of the screen, so the relative timing of the audio and MIDI tracks will remain unchanged. This type of software opens up lots of new creative possibilities. Just about all of the sequencer manufacturers are scrambling to add audio recording to their programs — often at little or no added cost.

FOLIO Notepad

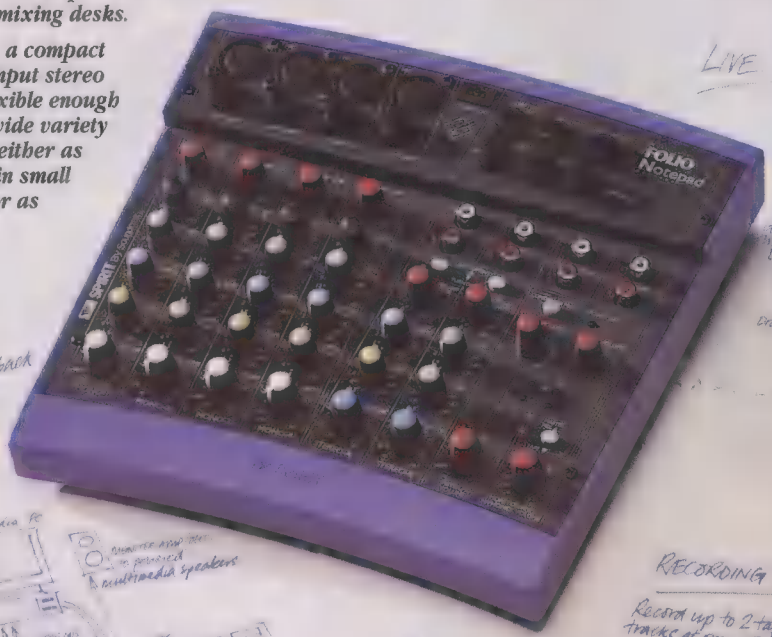
SPIRIT

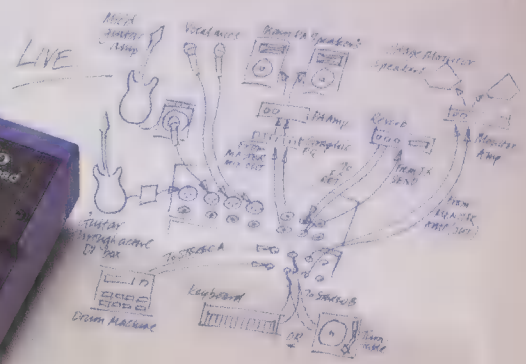
IT'S NOT A TOY...

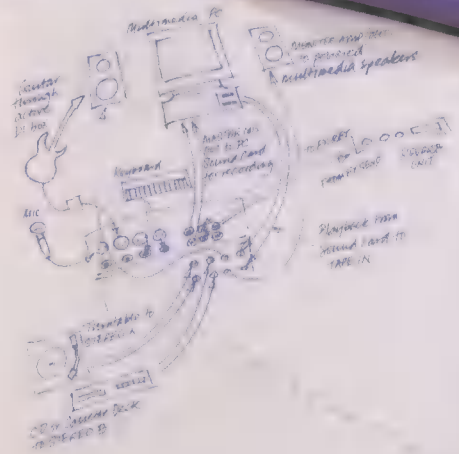
Spirit's newest micro mixer packs versatile professional features into the smallest package yet!

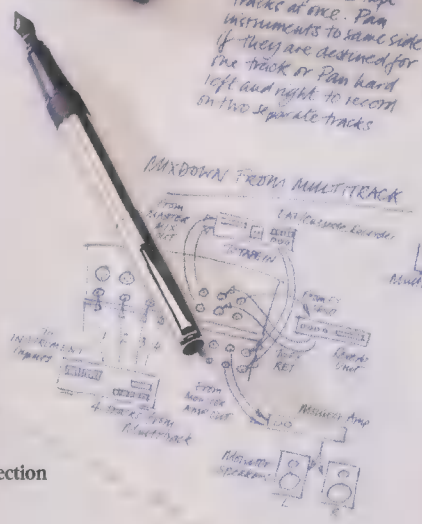
Unlike many small mixers, Notepad is no toy. It incorporates tried and trusted circuit designs and components used on our flagship mixing desks.

Folio Notepad is a compact DAT-quality 10 input stereo mixer that is flexible enough to be used in a wide variety of applications, either as the main mixer in small configurations or as a submixer in larger setups.









PROFESSIONAL FEATURES

- 4 balanced Mic & Line inputs with 48v phantom power
- 2-band EQ
- 2 stereo inputs with switchable RIA A for direct turntable connection
- post fade effects send and stereo return
- separate Mix and Monitor outputs
- 2-track return
- headphone output
- compact size (approx 9" x 9" x 2")

PROFESSIONAL SPECS

• Mic input	-128.5dBuEIN.,+14 dBu headroom, 68 dB max gain to output
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window, not the Arrange window. (According to Emagic, this can be thought of as a feature: You can assign the same key to do different things in different windows.)

The same behavior occurs when you use the standard DOS-type key equivalents for your menu selections. Want to use the Windows menu to open the Event List? The standard command is alt-W, but that will *only* open the Windows menu if the main Logic window (which is usually in the background) is the active window. The F10 key always switches to this window, however, so only one added keystroke is required.

Speaking of menus, Logic is a menu-intensive program. Each window has its own menu bar, and each menu, when it opens, is likely to be stuffed with submenus that pop up off to the side. While the menu layout is generally similar from window to window, it will take you a while to learn which items are tucked away where.

Fortunately, Logic's working methods are consistent from window to window. Editing a value with the mouse, for instance, is generally as easy as clicking on it and then dragging the mouse up or down. Some less expensive programs handle data entry in a clumsier way, with DOS-style pop-up windows in which you type values, or Windows-3.1-style up and down arrows. Logic is much more responsive. Just don't go changing your mind too often: It has an undo command for the most recent edit, but no redo!

MIDI Editing. Logic offers several slick methods for massaging your data.

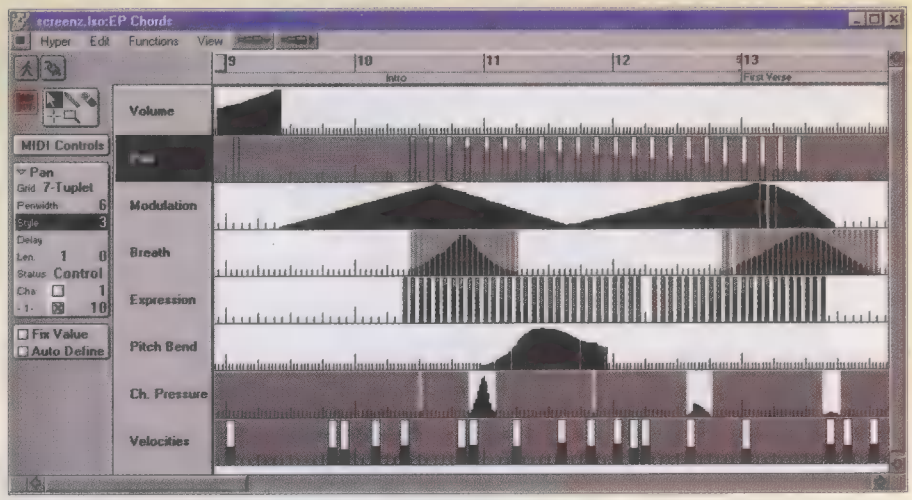

Fig. 4. *In the Hyper Edit window, you can display and edit a number of types of Control Change messages at once — also Aftertouch, Program Changes, and Note-On velocity values. Each of the horizontal zones displays a different type of event, such as Volume, Pan, or Modulation messages. Each shaded contour corresponds to a series of MIDI messages; you can edit their values or insert new data with a pencil tool, drag-copy data from one zone to another, or shift the timing of an entire event type forward or backward. The differences in shading are a visual aid; the user has four different options, any of which can be chosen for each event type.*

If drag-copying notes in the piano-roll-type Matrix display won't do the job, you can open the Transform window and sort the events using logical criteria such as MIDI channel, note duration, or position in the bar. Or maybe you'd rather edit your MIDI tracks by dragging notes around on a staff in the Score window. Because the various edit windows are linked, you can even select events in one window and then use a different window to edit them. They'll appear as highlighted in all of the appropriate windows. For example, you could select a group of notes in the Matrix window by dragging a rectangle around them with the mouse, and then use the Event List to change all of their velocities in parallel simply by clicking on the velocity value of one of them and dragging the mouse up or down.

A lot of editing action takes place in the Hyper Edit window (see Figure 4). This is primarily for editing MIDI controller data as graphic contours, but it's also where you change the timing of the various instruments in a drum groove. Logic splits drum kit editing between the Mapped Instrument window, where you assign drum note outputs, and the Hyper Edit window, where you edit the timing of the groove. Logic's chief competitor, Cubase, handles these two functions in the same window, which is definitely more convenient. On the other hand, Cubase only lets you look at one graphic controller contour at a time, along the bottom of its piano-roll window, so Logic has the edge here. Not only can you display as many as you can cram onto the screen, you can save your own Hyper Sets, each of which includes a number of types of events, and recall the Hyper Sets instantly from a pop-up menu. One Hyper Set might contain the MIDI volume controller data for eight different channels, for instance, allowing you to edit a complex crossfade graphically. Another might contain a dozen different types of controllers on the same MIDI channel, so that you can automate complex sonic changes in a synthesizer that has a superior controller implementation. (I like to do this with

What Is Velocity Compression?

Each MIDI Note-On message has a velocity value between 1 and 127. The velocity corresponds to how hard the key was struck. In velocity scaling (more accurately called velocity offset), a group of notes is selected for editing and their velocities are all raised or lowered by a large number. For example, with a scaling value of +20, three notes originally recorded with velocities of 65, 91, and 37 would be set to play back with velocities of 45, 71, and 17. In velocity compression (which, just to be confusing, is sometimes called velocity scaling), the velocities are multiplied or divided by some factor so that the differences between them get larger or smaller. With a compression value of 75%, for instance, the same three notes would be played back with velocities of 49, 68, and 28. The note with the largest starting velocity is reduced by the most, while notes that were played softly will play back closer to their original velocity (which should help them remain audible). Compression is a better way to smooth out the sound in a passage that was played a little too enthusiastically, without losing all of the player.

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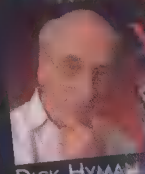

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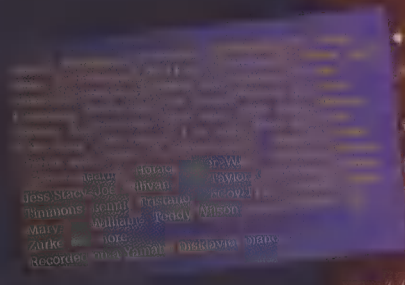

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the Waldorf Pulse, a monophonic analog synth that assigns every sound parameter its own MIDI controller. Controller data can be recorded direct from the Pulse's knobs by hooking its MIDI out to the computer's MIDI in, and then fine-tuned in Hyper Edit.)

While Hyper Edit is a powerful tool for editing a variety of data, including note velocities, Logic falls short of some programs in that it *won't* let you view note velocities as a graphic contour in the Matrix window. You can easily edit the velocities of a group of notes by selecting them in the Matrix window and then dragging the mouse up or down, but if you want to view the velocities graphically, you'll have to have a Hyper Edit window open at the same time. Because there's no requirement that the two windows be the same size or have the same zoom resolution, you may or may not be able to easily discern the relationship between the two displays while making your edits.

Logic's ability to quantize MIDI notes is among the best in the business. In addition to standard duplet and triplet values, it lets you lock your rhythms to quintuplets or septuplets. Hybrid duplet/triplet quantizing is also supported — a great convenience. You have to play a bit more precisely, but if you've done your part, Logic can discriminate correctly between duplet 8th-notes and triplets.

When quantizing to any of these rhythm values, you can choose any percentage of "swing," so that every other note plays after the expected beat. Rather than fully correcting the rhythms, you can use a "strength" parameter to move them partway from where you played them to the precise beat; this is a much better way of preserving some of the human element in your tracks than the randomized "human" rhythms used in some programs.

But that's just the start of the fun. In Logic, as in most high-end sequencers, you can quantize one sequence to the rhythms in another sequence. This is usually called "groove" quantizing, since you're using an existing rhythm groove as a template to apply to another musical part. Quantizing is a playback-only parameter, which means that you can always restore the original timing with which you played the part, or try a different

MIDI vs. Audio

A sequencer that includes digital audio tracks has to handle two very different types of music data. In case you're new to this technology, here's a quick summary.

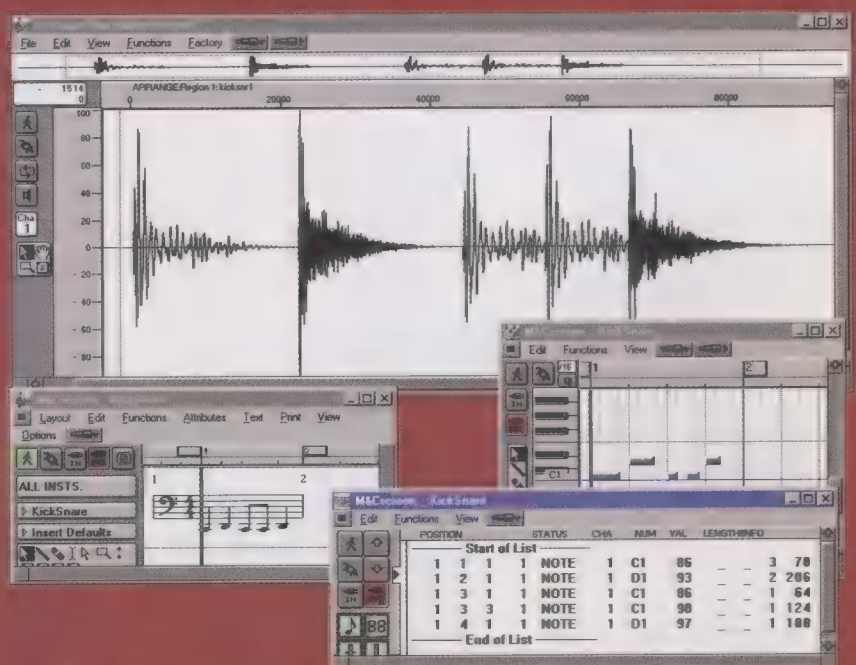
The audio recordings created by this type of program are very much like the digital audio on a standard CD. There are two differences: The audio is stored on your computer's hard drive rather than on a CD, and — because a hard drive is a read/write medium, while a CD is read-only — the audio data can be edited in various ways. Digital audio contains the actual sound of your performance, and can be used for any type of sound source — acoustic guitar or vocals, for instance.

Audio takes up a lot of hard disk space. If you're recording with standard CD fidelity (16-bit sampling at 44.1kHz), each minute of a monaural track requires 5Mb of storage. Multiply this amount by eight tracks, and you've got 40Mb per minute, or about two-thirds of a megabyte *per second* that needs to be read from the hard drive and sent to the audio output device. You'll need a fast computer and hard drive to handle this much data in real time.

MIDI data, on the other hand, doesn't contain any actual sound. It's only a series of commands that instruct a MIDI synthesizer, tone module, or soundcard what notes to play. MIDI has the advantage that it's far more compact than digital audio. Many songs can be stored on a single floppy diskette, and even a slow computer can play complex MIDI performances in real time. But since you can't record vocals or acoustic instruments in MIDI format, it's useful to have a single program that can do both types of recording.

MIDI data is inherently easy to edit. Let's say you record a melody, and then decide that it would sound better if it were an octave higher. The computer can instantly add 12 to each note number, and your musical problem is solved. With audio tracks, however, transposition is a *lot* tougher. The computer may need several minutes to chew on the data, and when it's finished you're quite likely to hear strange sonic artifacts embedded in the music. Tempo changes are just as easy in MIDI, and just as difficult with audio. Other types of edits, such as changing a flute sound to an oboe sound, are easy in MIDI but completely impossible with audio data.

Why use audio recording, then? Because it sounds better. Digital audio adds an element of realism and human expressivity that is difficult or impossible to achieve with MIDI.



The difference between MIDI data and audio data. I've recorded one bar of kick drum and snare drum as a classic rock beat. Top is MIDI (piano roll and Hyper Edit windows); bottom is audio (sample edit window). Event list window, lower left, shows only four events. Settings: 75 bpm, 480 ppqn. I used these events to trigger a MIDI drum module and recorded the module's output back into Logic as audio. At a two-second sample at a sampling rate of 44.1kHz, the same drum beat requires more than 88,000 bytes. The data is shown as a waveform in Logic's Sample Edit window.

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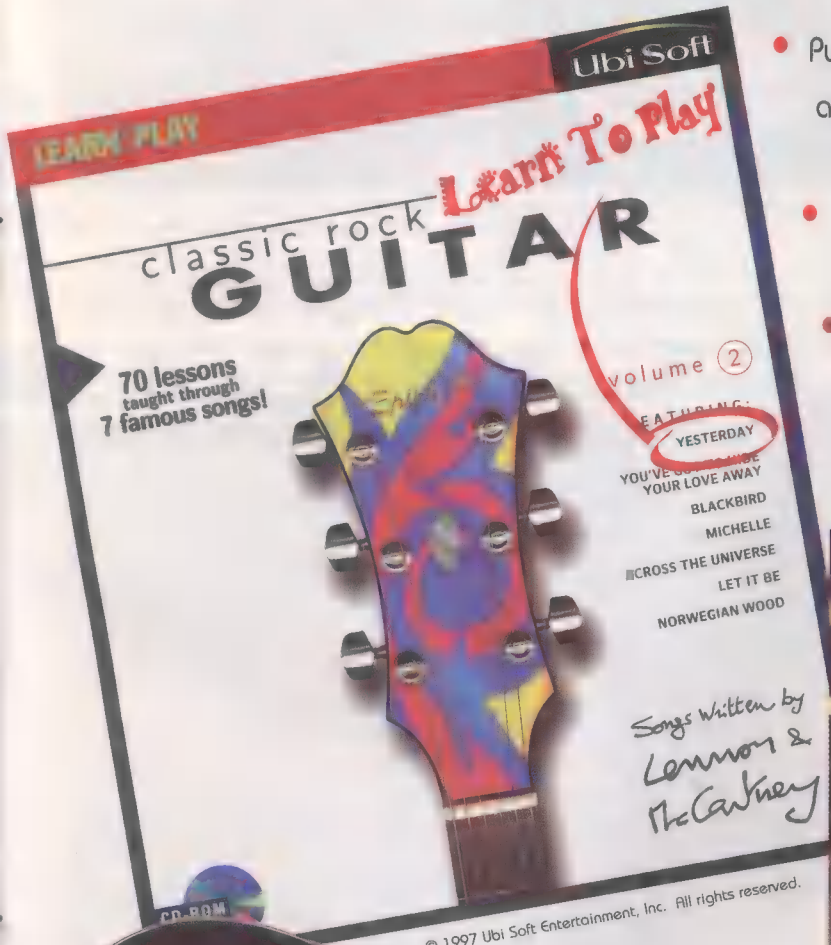

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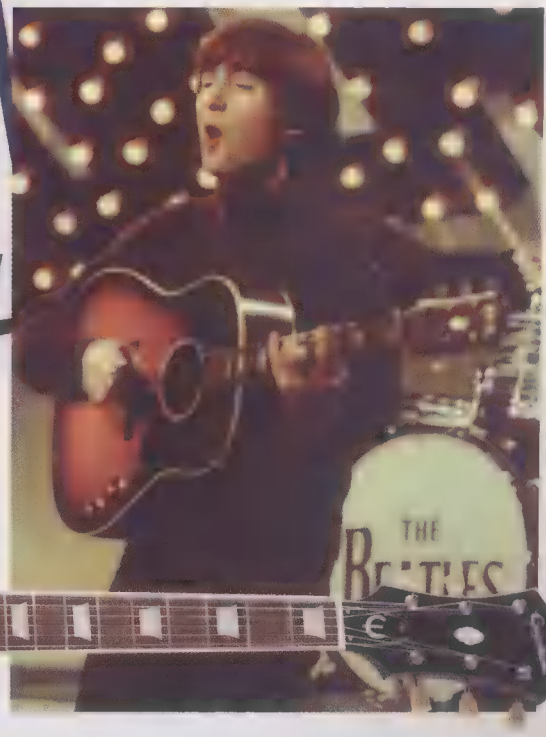

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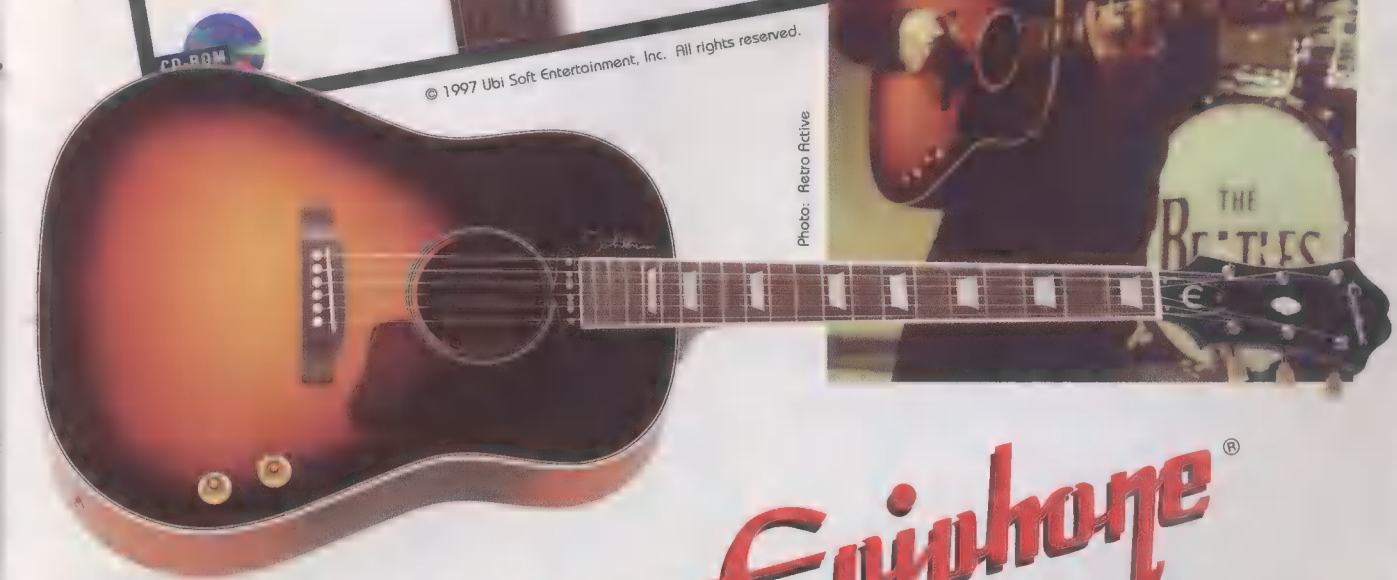

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type of quantizing — even after the song has been stored on disk for a month.

Audio Recording & Playback. Audio recording is not complicated. You start by telling Logic Audio what drive or directory you want to store your audio in, and then open up an Environment window containing the audio faders and their associated level meters. Unfortunately, audio metering is provided only during actual recording and playback; you can't test the input level ahead of time by looking at the meters. You can't adjust the record level from within Logic either; that has to be done at the source. The latter, at least, is due to the hardware limitations of soundcards.

You can link inputs 1 and 2 to record in stereo. Any recordings that are done this way are locked together, and will remain linked for editing purposes, which is not only convenient but necessary. As in most computer-based recorders, if your recording level is too high, the red "clipping" lights on the meters will light up. They'll stay lit until you clear them by clicking with the mouse, which is very helpful, as it allows you to do a recording without having to keep your eye on the meters.

Audio recordings appear in the Arrange window as "sequences" just like MIDI sequences. Each take is a separate sequence (or a parallel pair, if you record in stereo). Audio sequences can be moved around freely on the screen, muted, copied, snipped apart, and so on. The program also has an Audio window, which contains a list of all of the audio "takes" in the current song. In this window you can edit the start or end point of a sequence, which you might want to do so as to cut out a cough at the beginning of a vocal track, for instance. Also in this window, you can split up a single take into numerous audio sequences, which you might want to do if you've recorded several drum loops off of a sampling CD. After splitting them up, you can drag them into the Arrange window, where they'll snap to the nearest bar line.

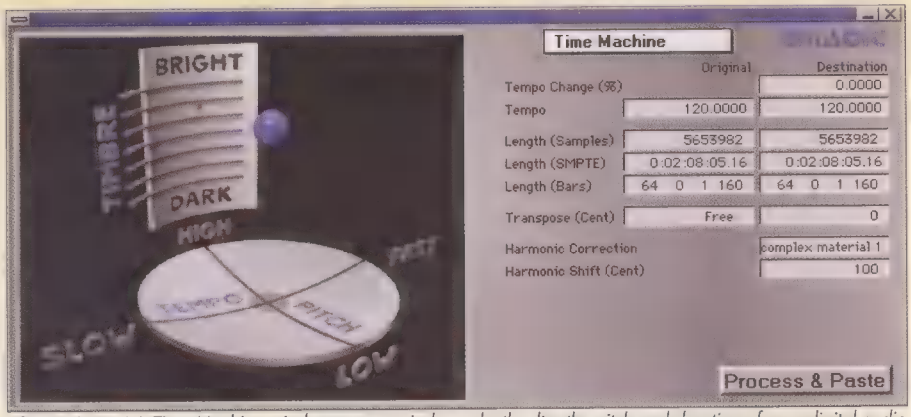

Fig. 5. *In Logic's Time Machine window, you can independently alter the pitch and duration of your digital audio tracks, with the option to choose between sound quality and the time it takes the computer to produce the output file.*

You can also use the mouse to position a movable "anchor point" within the audio sequence. The anchor point is used to align the audio sequence to a beat or bar in the Arrange window. This is an extremely important feature. If you've recorded a drum part, for instance, you can set the anchor at a visible peak in the audio waveform (such as a kick drum hit) and be assured that the drum will land on the downbeat.

If you've run out of audio tracks, but you still need to record another vocal overdub on the chorus, you can bounce down existing audio tracks to a new stereo submix. In Logic Audio, bouncing is done as an off-line process. You don't get to fiddle with the levels and panning while the music plays, and automated mixing data is not used. Logic can create a bounce that crossfades between two audio sequences, however; the time and curve of the crossfade can be programmed.

Here's another cool bit: Let's say you've sampled a two-bar drum loop into Logic Audio from a sampling CD. You lay out the loop a number of times, end to end, on an audio track, but when you set Logic's metronome to the tempo of the loop (at least, the tempo indicated in the CD's liner notes), your MIDI tracks don't sync properly with the loop. You need to change Logic's tempo setting — but what's the correct tempo? All you have to do is select one copy of the loop, set Logic's "locators" (start and end region markers) to bar 1 and bar 3, and then use a handy command called "Adjust Tempo Using Object Length & Locators" in a pull-down menu. It could hardly be easier.

Audio Editing. Double-click on an audio sequence, and you'll open the Sample Edit window. Stereo recordings appear as dual left/right files (a definite improvement on Cubase, which currently can only edit stereo recordings as independent mono files). In this window, you can position the start, end, and anchor point of an audio sequence with even greater precision. Standard cut/copy/paste is supported in this window, but curiously there is no "mix" or "merge" paste function. Merging of audio must be done as a bounce-down in the Arrange window.

Logic can perform various DSP (digital signal processing) tricks. As in most programs of this type, you can do gain normalization, a process that makes the audio file as loud as possible without adding distortion. You

What Is Punch-in Recording?

Let's say you've recorded a musical passage (it could be either audio or MIDI). Although the beginning and ending are fine, there's a mistake in the middle. With punch-in recording, you can do exactly that: The middle part of a recorded track can be replaced with new material without disturbing the start or the end. Most sequencers will do either manual or automated punch-in. To punch in manually, you start playback before the spot where you want to re-record and then hit the record button when you reach the spot. To automate the punch, you set a *punch-in point*, which is the place where the new recording will start, and a *punch-out point*, which is where recording will stop. By setting a *pre-roll* time, you can listen to your previous take for a few bars prior to the punch-in point, so as to get the right feel.

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can fade in the beginning of a region, or fade out the end. You can make a region silent (useful for getting rid of background noise), or reverse it for a special effect.

The DSP functions in Logic's Digital Factory menu are even more impressive. You can stretch or compress the length of an audio region without affecting its pitch, or vice-versa. (See Figure 5 on page 48.) Many dedicated samplers have this type of function, as do most audio editing programs, but you don't always find it in audio recorders. If a singer recorded one note slightly flat, you can fudge it up to pitch — but since I like going to extremes, I'd rather use time-stretching to turn a TV announcer's voice into a robot from hell. An "Audio Energizer" algorithm performs the equivalent of analog tape saturation. This type of compression makes a signal sound louder and more punchy.

Logic has a command called "Audio to Score," which is supposed to extract the pitch and rhythm information from an audio file and translate it into MIDI data. This is only intended to work on monophonic audio, such as a vocal or flute melody. I was unable to get this feature to perform very well; it tended to produce lots of weird little notes in addition to the synthesizer line I had actually played. Plainly, some experimentation with the settings is required if you want decent results.

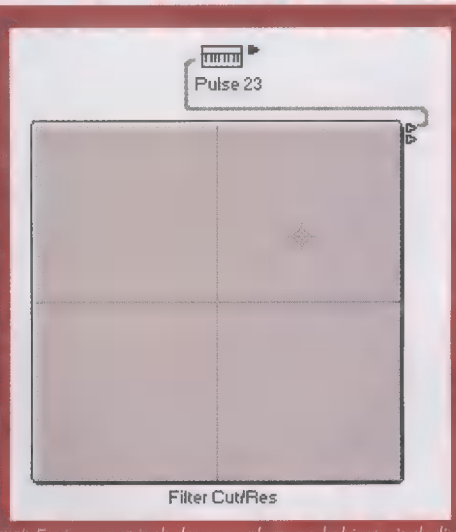
For most applications, mix automation is much more important. In mix automation, you record moves on the software knobs and faders with the mouse, and the program responds by automating your changes in level and pan position. Sad to report, the present version of Logic is a severe disappointment when it comes to automated mixing of audio tracks for playback through a soundcard. (MIDI volume automation works perfectly, however.) You can indeed record and edit volume and pan controller data for the audio — but the actual response of the soundcard's output to your programmed controller contours will always be two or three seconds late. If you program a fadeout to occur during bar 9, you'll still hear full-volume audio blasting out during bar 9 and most of bar 10.

Starting Out Logical

If you'd like to experience Logic or Logic Audio but are put off by the $699 price tag, you might want to take a look at Micro Logic ($99) or Logic Audio Discovery ($299). As befits an entry-level sequencer, Micro Logic is pretty stripped-down: no environment, no screen sets, and a very limited set of scoring features. The only editing windows are the Matrix (piano-roll) window and the event list. Logic Audio Discovery has a lot more features, but is missing things like the markers in the Arrange window, the extended sequence parameters (which means fewer quantization options), the environment data processing objects, and scoring features like guitar tablature, multi-bar rests and page numbering. For audio tracks, Logic Audio Discovery for Windows supports only standard Windows soundcards, the Digidesign Audiomedia I or III card, and 12 tracks of playback on the Emagic Audiowerk8.

Needless to say, this renders the automated mixing feature all but unusable. The temptation is to blame the soundcard's driver software for sluggish response — but the automation in Cubase Audio works the way it's supposed to, even when playing on the identical soundcard. I sure hope Emagic fixes this problem in their next update. (According to Emagic, the automation response will be noticeably faster in version 2.6, and faster still using the Audiowerk8 hardware.)

Depending on what audio hardware you're using, you may be able to process your tracks with software EQ. Digidesign's Audiomedia III card has on-board EQ, as does the Audiowerk8. EQ settings can also be automated.



Logic's Environment includes several unusual objects, including this XY vector palette, which is "played" in real time with the mouse. The current position is shown as a crosshair indicator, and the output of the vector palette is being sent to my Waldorf Pulse synth. In effect, the vector palette is two sliders in one. The mouse's horizontal position (the x-axis) is output as one type of controller data, while the vertical position (the y-axis) is a second type of controller data. By assigning the x-axis to MIDI volume and the y-axis to MIDI panning, you could make a sound appear to move around in two-dimensional space between the speakers, getting closer or further away as it moves from left to right.

Analysis, Mr. Spock? If you've stuck with us through this truncated but still regrettably labyrinthine tour of Logic, you've probably got a feeling by now for its depth and power; also for its little quirks. It's even more complex than a high-end word processor. And as with a word processor, few users will ever take advantage of the full range of features. Far more likely, you'll find a way of working in Logic that suits you, and never venture into other areas.

On the audio side, cutting and pasting your tracks is a quick and easy process. Time- and pitch-shifting are standard features — not the case on most audio recorder/sequencers. The mix automation, however, is in a very inadequate state. I'd also like to see a good off-line parametric equalizer added to the DSP. There's room for improvement here, but Logic Audio takes care of the basics very well.

The great thing about Logic — one of the great things — is that it gives you so many ways to set up your own way of working. Its user interface is quite fast, once you learn it: You can do complex MIDI edits quickly. And the Environment is an absolutely unparalleled resource for realtime processing within a sequencer. If your sequencing needs are modest, there's no need to invest in a program like Logic. But as a tool for the professional, it's got the goods.

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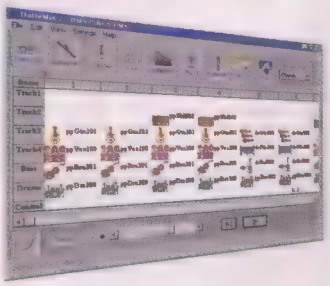

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Meet the Winners of . . .
The Mixman Remix Contest!

In the Jan/Feb '97 *M&C*, we staged a contest with Mixman to find the best remix DJs in the desktop music world. The rules were simple: Download the free demo software from Mixman's Web site, slam together a new mix using the built-in hip-hop loops, and send it in.

In early April, assistant editor John Krogh and I drove up to Mixman's headquarters in San Francisco, where Mixman personnel loaded all the entries into a subwoofer-equipped PC and let 'em rip. Many pizzas and much arguing later, we crowned the top three mixes. (Four, actually. It was a tough choice.)

The talented winners received **$1,049.85 worth of prizes**, including **Advent** Powered Partners speakers, a **Creative Labs** Sound Blaster AWE64 soundcard and 8X CD-ROM drive, **Mixman** software and clothing, and a free subscription to ***Music & Computers***. Here's how they did it. —*David Battino*

GRAND PRIZE

"PEEREBOO.MID" **Jan Peereboom**
Bovenkarspel, The Netherlands

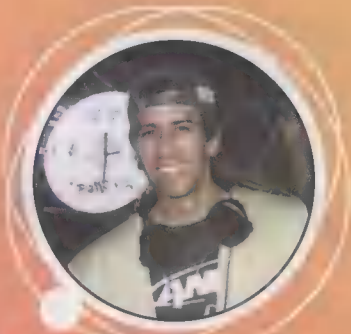
Jan's mix caught our ears right away because it was always shifting direction. Most people would dial up a drum loop, let it repeat four times, add a bass line, let it repeat, and so on. Catchy, but predictable. Jan danced around the beat in surprising and effective ways while never losing the pulse.

"I listened very carefully to the demo and practiced every day," Jan tells us. "I discovered which sounds fit together best. I learned to listen to the beat like a drummer, paying special attention to where the first beat in a measure was. To touch the right keys, I marked them with pieces of tape. In the end, I played the computer as a special sort of musical instrument.

"Then I tried to make a remix as if it were a new piece of music. I took care there was a smooth beginning, worked to a climax, and then a cool ending. I made many different remixes and played them for other people. I listened to their criticism. I performed the best pieces all the time until there were not too many wrong keystrokes. Finally, I chose the best one for uploading."

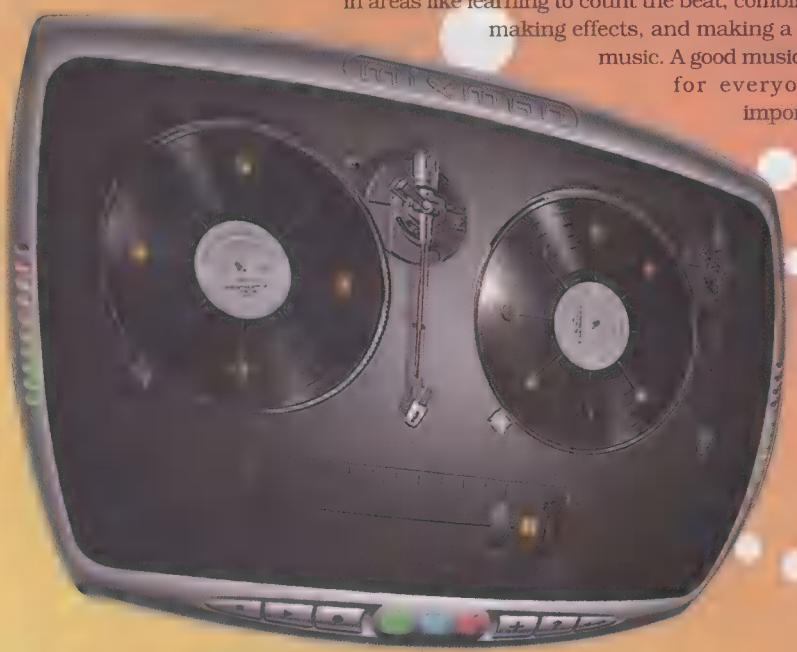
Jan got into desktop music 20 years ago by building his own computer and programming simple music applications in hex code. Today, he's a music teacher.

"The computer has become my right hand in the classroom," he reports. "We sing along with MIDI files I've downloaded from the Internet and study music with the help of a sequencer program. Nevertheless, we could take more advantage of the computer (like for ear training) if we had more than one in the classroom. I think Mixman has a high educational value in areas like learning to count the beat, combining sounds, making effects, and making a new piece of music. A good musical education for everyone is very important."



SECOND PLACE

"TRUEREA1.MID" **Elvin Morales**
Brownsville, Texas



THIRD PLACE (TIE)

"MSTERIU1.MID" **Michael Brown**
Satsuma, Alabama

THIRD PLACE (TIE)

"KICKMIX.MID" **Milan Djokic**
Beograd, Yugoslavia

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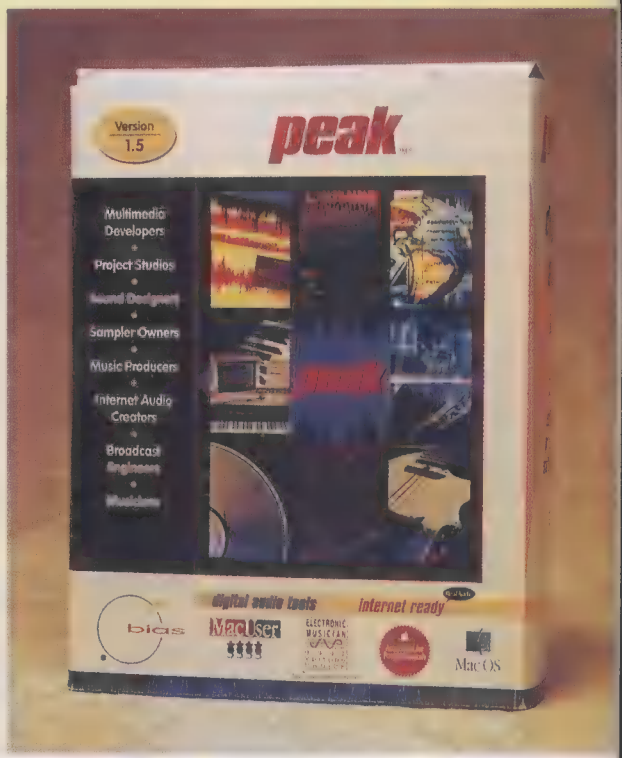
BIAS Peak 1.52

Stereo Audio Editing Software (Mac)

by David M. Rubin



Among musicians and sound designers, the primary tool for tweaking sounds at the microscopic level has always been the venerable stereo editing application. Yet in spite of the prominence of the Macintosh in the music field, there are surprisingly few pro-level stereo audio editors for the Mac. That old standby, SoundEdit 16, has gotten some nice enhancements by Macromedia, but it's still a mid-level program aimed mainly at multimedia producers. The perennial leader of the pro audio pack, Digidesign Sound Designer II, hasn't had a face-lift in years and it's definitely looking a bit long in the tooth. It no longer supports plug-ins in SDII format, for instance, and it won't even launch unless you have a Digidesign audio card in the computer.

The Mac has long been overdue for an up-to-date, modern-looking audio editor for today's desktop musician. Fortunately, Berkley Integrated Audio Software (BIAS) has come to the rescue with a substantial upgrade of Peak, its versatile audio editing program. This latest incarnation fulfills much of the promise of the original release. Although Peak still lacks a few important features and the user interface could use some refinement, it's well on its way to becoming the audio editor of choice for Mac-based musicians.

Peak is designed to maximize performance on Power Macs (through its native code), but it works on earlier models as well; the installer utility intelligently gives you the correct version for your machine. Peak supports the Mac's onboard audio in addition to third-party audio cards — including those from Digidesign. Like most digital audio applications these days, it records to and plays audio data from the hard drive.

Unlike a multitrack audio recording program, Peak is limited to stereo (two-track) operation. Among the reasons why you might want to buy it rather than a multitrack audio/sequencing program: support for transferring sound files to and from a sampler, batch processing (especially handy for multimedia developers), and an editing environment that's optimized for working with audio.

The Look & Feel. Peak makes excellent use of color. The program lets you customize the main editing window by choosing different colors for the waveform, the background, and various kinds of markers (see Figure 1 on page 55). You can try one of several preset color schemes or go wild with your own favorite color combinations.

Starting with version 1.5, Peak also includes an overview display at the top of the main window — similar to the overview in Sound Designer II. It lets you see the whole audio file at once and move directly to any spot within it. Clicking in the overview with the mouse starts playback at that location. A rectangular frame in the overview indicates which part of the recording is currently visible in the large waveform display below, which really helps you stay oriented when you're working on a long soundfile.

Peak's user interface is generally clean and elegant, but its emphasis on visual simplicity makes the program more awkward to use than it need be. The transport controls, for example, appear on a floating palette that always seems to be in the way no matter where you put it — unless you shrink the window to less than maximum size. I would much rather have a narrow toolbar at the top or bottom of the screen with small transport buttons, readouts, and other useful tools. Peak's transport offers only four buttons: Play, Stop, Record, and Loop Playback. I found myself constantly wishing I had a Return-to-Zero button, a Play Selection button, and maybe some buttons for other commonly used functions. Peak does offer a variety of playback options, but they're only accessed through a Preferences dialog box and a collection of confusing key combinations.

Similarly, Peak offers no on-screen Zoom tool. To zoom in and out on a waveform, you have to use the program's Action menu or another set of key combinations.

To hear Peak's unique signal processing in action, visit www.music-and-computers.com.

I'd much rather have a magnifying glass tool, as in Adobe Photoshop, or buttons on the scroll bars, as in SoundEdit 16. Peak has a Vertical Scaling feature, which is a big help when editing quiet sections (like the tail of a reverb). But it doesn't even appear on a menu; it's only accessible through a key combination. A few more onscreen buttons and less reliance on key combinations would be nice.

Marking Your Territory. One of Peak's strongest features is its flexible and intuitive use of markers. Markers appear in the waveform display as thin vertical lines with accompanying labels. They're great tools for identifying important places in a recording. (Marker names can be up to 255 characters long.) From the keyboard, you can drop a marker in "on the fly" as the audio plays. With playback stopped, you can insert a marker anywhere in the waveform using the mouse. In either case, you can drag the markers left and right to re-position them, label and re-label them whenever you want, and define them in several ways.

A marker can serve as a time-related reference (independent of the waveform) or

PHOTOGRAPH: PAUL HAGGARD

it can be anchored to a specific point in the waveform (independent of time). When anchored, the marker will always identify the same sound in the waveform, no matter what cutting and pasting you do. That can come in very handy if you do a lot of dialog editing or if you don't want to lose track of some glitch in the recording that needs attention later.

You can also define a marker as a loop beginning or end point. Looping is a breeze in Peak, whether you're working on rhythm phrases or instrument samples. Simply put the program in Loop Playback mode and drag the loop markers back and forth as you listen to the section between them. You can even drag the two loop markers in tandem to a different place in the waveform. Looping rhythm parts is especially easy. Peak's Loop Surfer feature lets you specify a tempo and number of beats. Then it creates a loop of the proper length starting at the point you've selected. It worked quite well for me, allowing me to grab a recorded two-bar drum loop with precision. Each soundfile can have one looped section which most samplers will recognize as a sustain loop when they import the sample. [*Ed. Note: For more on samplers and loops, see the May/June '96* M&C. *Also see "What's a Sampler?" on page 56.*]

With version 1.5, Peak has introduced an important new feature: playlist editing. Using markers, you can now define areas in a waveform as "regions" and assemble these regions into a playlist. (Peak also recognizes Sound Designer II regions in existing files.) Once you create a playlist, you can play the different regions in any order, and as many times as you want, without altering the original soundfile. Peak even lets you use regions from more than one soundfile in a single playlist.

The regions that make up a playlist appear chronologically in Peak's new Playlist window, which shows the Start and End times for each "event" (see Figure 2 on page 56). You can also create custom crossfades between events, set the gain for each event (so the overall volume stays consistent from one event to the next), and Power Mac users can apply up to four realtime DSP effects (such as reverb or EQ) independently to each event. To re-arrange the order of events, you simply drag any event to a new position in the list. The whole process is easy and intuitive.

A playlist is a great tool for mastering a multi-tune demo, rearranging the order of drum hits in a rhythm loop, or creating different versions of a song (adding an extra verse before the chorus, etc.) based on the same recording. Unfortunately, Peak's usefulness for post-production work on film and video projects is limited by the program's lack of support for SMPTE timecode. Peak can display SMPTE numbers in its waveform display, but (unlike Sound Designer II) it can't trigger playlist events from incoming timecode. That's an essential feature for synchronizing sound effects, dialogue, and musical cues to picture. BIAS president Steve Berkley reports that a future upgrade will include SMPTE support.

Eve of Destruction. Playlist editing is commonly referred to as *non-destructive* editing because you can change the order of events in the playlist without altering the original audio file. Unlike most other audio editing programs, however, Peak has extended this concept to include virtually all of its editing operations. Peak lets you cut, copy, paste, fade in/out, reverse, delete, and otherwise mangle an audio file as much as you want, and the original recording remains intact — at least until you save the file, at which point the changes become permanent.

As a result of this non-destructive editing approach, Peak can offer unlimited undo/redo capability; a terrific feature that encourages fearless experimentation and speeds up processing. With Peak, no matter how far astray you've gone, you can always back out of a series of edits, just by using the Undo command in the Edit menu. Furthermore, Peak keeps a running list of your edits and displays them in its Edits dialog box (see Figure 3 on page 57). This box lets you go directly to a previous edit and begin editing anew from that point — a powerful and time-saving tool.

Recording & Playback. Recording new sound files directly within Peak is easy. Clicking the Record button on the Transport palette opens a window where you choose from several recording options, including the input source, number of channels (stereo or mono), resolution (8- or 16-bit), and sampling rate (from 11 to 48kHz). A large LED-style display reads out the available recording time, another display shows elapsed time, and a set of tricolor VU meters lets you monitor the recording level.

With version 1.5, Peak introduces a cool feature called the Notepad. It appears as a blank text area in the Record window once recording is underway. Each time you

DESCRIPTION
Stereo digital audio editing software.

HARDWARE & SOFTWARE REQUIREMENTS
68030 Mac with minimum 25MHz speed, 68040, or PowerPC; 8Mb of RAM minimum, 16Mb for PowerPC; System 7.1 or later; Apple Sound Manager 3.1 and QuickTime 2.0 or later; hard drive with 18ms average seek time or better; color monitor recommended.

FEATURES
Direct-to-disk recording and playback with non-destructive editing and unlimited undo/redo. Playlist editing with support for Sound Designer II regions. Imports and exports several audio file formats, including AIFF, Sound Designer II, .WAV, and SND. Imports Red Book audio directly from CD. Encodes RealAudio files for the Internet. Batch file processing, DSP tools, looping options, markers, and audio scrubbing. User-defined graphic fade in/out, crossfade, and blending features. Imports and exports files from several brands of MIDI samplers through SMDI and MIDI Sample Dump Standard. Plug-in architecture supports Adobe Premiere audio plug-ins.

COPY PROTECTION
Key disk with three installs.

SUGGESTED RETAIL PRICES
$499; upgrade from Peak LE or competitive upgrade from any version of Passport Alchemy, Digidesign Sound Designer, or Macromedia SoundEdit 16, $299.

CONTACT
Berkley Integrated Audio Software (BIAS), P.O. Box 2481, Sausalito, CA 94966; 800-775-BIAS (2427) or 415-331-2446; fax: 415-331-2446; Web: www.bias-inc.com.

PROS
Unlimited undo/redo, unique DSP options, scrub playback, playlist editing with crossfades and DSP, easy-to-use markers and intuitive looping features. Supports several MIDI samplers. Supports Macs without additional hardware as well as third-party audio cards.

CONS
Cannot synchronize playlist to SMPTE timecode. Floating Transport palette needs more controls. Over-reliance on key combinations to operate the program. Lacks on-screen zoom tool.

BOTTOM LINE
Peak is a powerful program that keeps getting better.

hit the Return key — as the recording is taking place — Peak inserts a "Notepad Cue" at the current location. You can type descriptive comments into the Notepad box without interrupting recording. These comments then appear in the waveform display alongside markers. Your comments can be anything from a simple label like "chorus" or "solo" to more lengthy descriptions of musical events, sound effects, references to lyrics, or even lines of dialog.

As mentioned earlier, Peak offers a number of playback options (including adjustable pre- and post-roll — the ability to play back audio slightly before and after the section you want to record over), but most playback options are only available through key commands. Clicking the Play button in the Transport palette or hitting the keyboard's spacebar will play the audio file either from its beginning or from the current insertion point, depending on the setting in the Preferences dialog box. I would rather have some on-screen buttons to switch between those options. It would mean less changing back and forth between the mouse and keyboard.

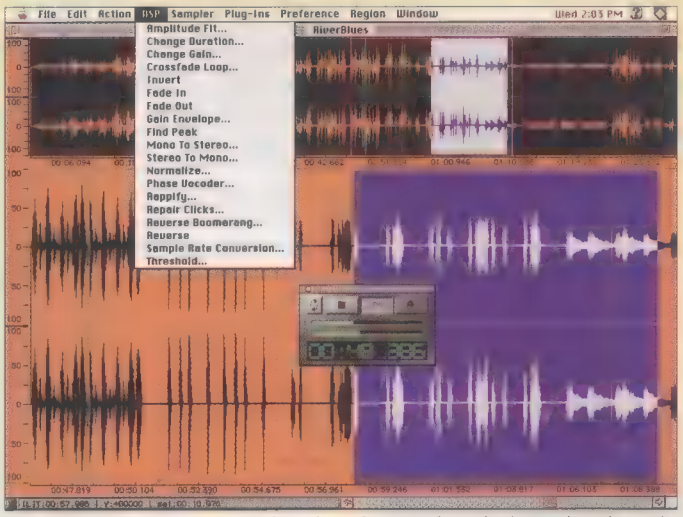


Fig. 1. *Peak lets you customize the colors of its waveform display and markers. The overview at the top of the window shows the entire audio file. The portion of the wave that's visible in the main screen is indicated in the overview by the rectangular outline. The floating Transport window offers few controls, however, and always seems to be in the way.*

All pro-level editing programs now include an audio scrubbing feature in their arsenal of tools, and Peak is no exception. Scrubbing evolved from the tape-editing procedure of slowly dragging the tape forward and backward across the tape recorder's playback head to pinpoint the exact place to make an edit. With digital audio editors, a similar effect is achieved by dragging the mouse left and right (at different speeds) across the waveform display.

In standard scrubbing, as the playback speed drops, the pitch falls as well, producing the familiar phonograph-when-the-power-fails effect. Peak will play forward or backward at plus or minus four times the normal speed, with an accompanying change in pitch.

Sometimes the pitch change makes it hard to identify what you're hearing, though, so Peak includes another playback option called Dynamic Scrubbing. With Dynamic Scrubbing, as you drag the mouse over the waveform, the program plays a short loop of the audio immediately preceding the cursor point (the loop length is selectable from 10 to 600 milliseconds). As you move the mouse

through the waveform, each looped fragment gives way to the next, providing a choppy but recognizable rendition of the recording. Although it seems a bit strange at first, it really works quite well. You can drag the mouse as slowly as you want without the audio sounding like it's stuck in molasses.

Editing. Aside from the usual cut, copy, and paste types of edits, Peak offers a number of useful and sometimes unique commands for shaping and modifying sounds. There's an easy-to-use Fade In/Out command with graphic, user-definable envelopes (see Figure 4 on page 58), and a similar Crossfade command for smoothing out loops. The program also offers a Blending option, which automatically applies a short user-definable crossfade at edit points to smooth over abrupt cuts and pastes. Crossfading is especially useful when you're processing a small segment of a file with EQ or pitch correction; it prevents a pop or click that might otherwise occur at the edges of the edit.

In addition to the Fade and Crossfade commands, Peak offers a useful assortment of other tools in its DSP menu. The Mono-to-Stereo and Stereo-to-Mono commands, for example, convert soundfiles between one- and two-channel formats. Stereo-to-mono conversion mixes the left and right waveforms into a new, composite waveform. The Gain Envelope command lets you create an envelope to selectively increase and/or

Fig. 2. *In Peak's Playlist window, you can arrange different regions in an audio file to play in any order. The program lets you crossfade between regions, adjust the gain independently for each region, and — for Power Mac users — apply up to four realtime DSP effects per region.*

What's a Sampler?

A digital sampler is a musical instrument that can record sounds into its own RAM memory and then play the sounds back, usually under MIDI control. Some PC soundcards can function as samplers, but most samplers are in the form of rack-mount modules with their own hard drives. In addition to playing back segments of digital audio (called "samples"), a sampler allows the samples to be customized with filters, envelope generators, and LFOs, just as if they were synthesizer sounds.

Most samplers have some basic audio editing capabilities. They'll allow you to *truncate* a sample, for instance (delete sections at the beginning and/or end) so as to make efficient use of memory. More expensive samplers also include some basic DSP (digital signal processing) commands. You may be able to *normalize* the gain (make the audio as loud as possible) or do time-stretching and pitch-changing. But no sampler has the depth of DSP horsepower of a computer program like BIAS Peak. —*Jim Aikin*

Peak's Change Duration command gives reasonable results when time-compressing or expanding rhythm tracks. You might use this type of utility to take a sampled drum loop that was originally at a tempo of 108 bpm and shorten it so it will fit a tune that's at 111 bpm. And you can split up a drum track into its rhythmic elements thing, you can export the regions into a playlist or another audio file and rearrange them to create new musical patterns. Because the regions typically fall on the beats, they often make good loop points for creating looped rhythm patterns.

If you enjoy twisting sounds in unusual ways, you'll appreciate the Reverse Boomerang command, which mixes a reversed copy of a selection with the original. "Rappify" applies rhythmically influenced dynamic filtering to a selection, and Convolve lets you apply some of the characteristics of one sound onto another. The more complex Phase Vocoder feature lets you modify the pitch and/or duration of a sound based on a frequency spectrum analysis — which sounds pretty mysterious in words, but the results can be extremely cool musically. [*Ed. Note: .music-and-computers.com for of these effects.*]

ion to its own set of sound-pro-tions. Peak offers access to a wide range of other software tools through its support of the Adobe Premiere Audio plug-in standard. Several companies — including InVision Interactive, Waves Ltd., and Arboretum Systems — offer tools for applying reverb, EQ, multi-effects, compression, file conversion, and other processes. (Demos are included with

through the waveform, each loope
gives way to the next, providin
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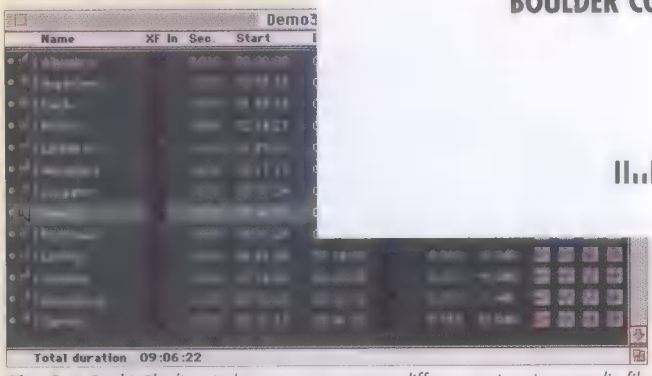

Fig. 2. *In Peak's Playlist window, you can arrange different regions in an audio file to play in any order. The program lets you crossfade between regions, adjust the gain independently for each region, and — for Power Mac users — apply up to four realtime DSP effects per region.*

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processing) commands. You may be able to *normalize* the gain (make the audio as loud as possible) or do time-stretching and pitch-changing. But no sampler has the depth of DSP horsepower of a computer program like BIAS Peak. —*Jim Aikin*

decrease the amplitude of particular regions within a waveform. The Normalize and Amplitude Fit commands provide two alternate ways of increasing the loudness of a selected passage without causing clipping. To better analyze your audio files, the program also includes a Find Peak command that places the insertion point at the place in the waveform with the greatest amplitude.

To repair digitally induced clicks in an audio file, Peak provides a Repair Click feature that automates the process of searching for and smoothing out clicks. This feature is not effective for cleaning up scratches and pops on old vinyl recordings, however. That takes additional editing.

Peak's Change Duration command gives reasonable results when time-compressing or expanding rhythm tracks. You might use this type of utility to take a sampled drum loop that was originally at a tempo of 108 bpm and shorten it so it will fit a tune that's at 111 bpm. And you can split up a drum track into its rhythmic elements with the Threshold command. This lets you define a cutoff amplitude that's used to automatically create a series of new regions. When the software has done its thing, you can export the regions into a playlist or another audio file and rearrange them to create new musical patterns. Because the regions typically fall on the beats, they often make good loop points for creating looped rhythm patterns.

If you enjoy twisting sounds in unusual ways, you'll appreciate the Reverse Boomerang command, which mixes a reversed copy of a selection with the original. "Rappify" applies rhythmically influenced dynamic filtering to a selection, and Convolve lets you apply some of the characteristics of one sound onto another. The more complex Phase Vocoder feature lets you modify the pitch and/or duration of a sound based on a frequency spectrum analysis — which sounds pretty mysterious in words, but the results can be extremely cool musically. [*Ed. Note: Visit www.music-and-computers.com for examples of these effects.*]

In addition to its own set of sound-processing options, Peak offers access to a wide range of other software tools through its support of the Adobe Premiere Audio plug-in standard. Several companies — including InVision Interactive, Waves Ltd., and Arboretum Systems — offer tools for applying reverb, EQ, multi-effects, compression, file conversion, and other processes. (Demos are included with

Fig. 3. *Peak's non-destructive editing approach provides unlimited undo/redo capability. The program even keeps a running list of your edits and lets you return directly to an earlier state in your editing session.*

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Peak.) Additionally, BIAS has just released its own modular synthesis and multi-effects plug-in called SFX Machine.

With version 1.5, Peak also introduces a powerful new Batch File Processor, which lets you perform a series of DSP and other editing processes — including those provided by plug-ins — on a large number of files at once.

Import-Export Business. Multimedia producers who use pre-recorded music and musicians who work with samplers will especially appreciate Peak's ability to directly import tracks (known as Red Book audio) from audio CDs. Simply insert an audio CD into your Mac's CD-ROM drive and choose "Import CD Track" from the File menu. (Not all CD-ROM drives support this feature; contact BIAS for more information.) The track appears as a waveform in Peak, ready for editing and looping. Through its support of SMDI (SCSI Musical Data Interchange), the program can transfer samples to and from a number of MIDI samplers, including models from Peavey, Kurzweil, and E-mu. It also supports some Ensoniq samplers with a separate proprietary SCSI protocol. And for some older samplers, Peak supports the slower (much slower) MIDI Sample Dump Standard.

Peak also imports and exports AIFF, Sound Designer II, .WAV, System 7 sound, and QuickTime audio files. It can read .AU and Macintosh SND formats as well. The program also supports MACE, IMA, and μ-law file compression schemes, and the RealAudio format from Progressive Networks. That makes it a useful tool to prepare, optimize, and export audio for the Internet.

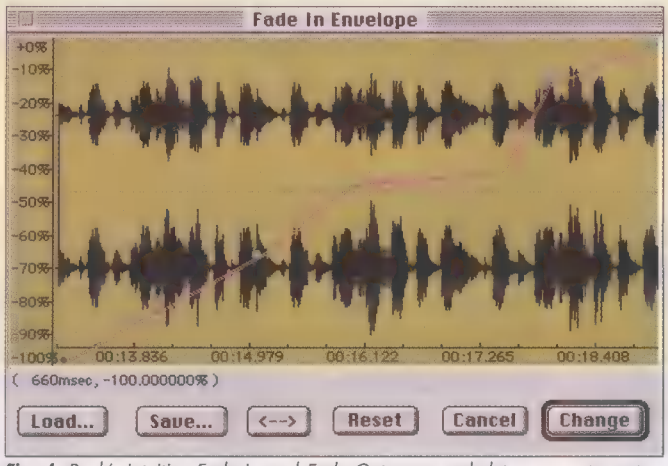

Fig. 4. Peak's intuitive Fade In and Fade Out commands let you create custom envelopes that can be applied to selected areas in the waveform.

Conclusions. Peak is a user-friendly yet powerful program. It provides some inventive solutions for the process of editing digital audio. The helpful overview display, versatile markers, playlist editing, scrubbing feature, DSP options, and support for plug-ins clearly place it in the rarefied arena of pro-level Macintosh stereo editors. I'd like to see the user interface refined a bit, and support for SMPTE timecode (now in the works) will be a big help to post-production studios. With one more update, Peak will no doubt be king of the mountain.

David M. Rubin owns a computer-music studio in the Los Angeles area where he composes for film, video, and multimedia. His latest book, The Desktop Musician, *is available from McGraw-Hill. You can reach him at DMRubin@aol.com.*

PG Music Band-in-a-Box 7.0

(PC, Mac)

by John Krogh

Stravinsky's *Rite of Spring*, Shakespeare's *Hamlet*, and Coltrane's *A Love Supreme* — all of these works were born from, and serve as, sources of inspiration. Certainly all three artists employed some sort of tool in the creative process — perhaps a piano or pencil. The point is that *something* was used to help them realize their inspiration. Every once in a while, a tool comes along that offers so many exciting possibilities that it becomes a source of inspiration in and of itself. Take Band-in-a-Box, for instance. This auto-accompaniment program offers so many possibilities for educators, gigging musicians, and songwriters that it's truly inspiring.

Band-in-a-Box (hereafter referred to as BIAB) generates accompaniments, harmonies, and solos in a variety of styles, and plays them back through a multitimbral sound module or soundcard. In addition, you can record melodies into BIAB and print out lead sheets for every instrument of the accompaniment. Songs can be saved as Standard MIDI Files, allowing you to play your accompaniments using any MIDI synthesizer. You can also create your own styles; however, the wide variety of styles that are available right out of the box is impressive. Recording parts into BIAB is easy if you have a MIDI input device, but if you don't, you're in luck. Accompaniment rhythms, drum patterns, and chords can all be entered using the computer keyboard and mouse. There's even a Wizard function that maps certain QWERTY keys to diatonic notes, so you can solo directly from your keyboard!

But a lot of aspects and concepts in BIAB will be lost on the less-experienced musician, so a good understanding of musical genres will come in handy if you want to take full advantage of all that BIAB has to offer.

At the time of this review, version 7.0 was only available for Windows. Version 7.0 for the Mac should be released by the time you read this.

At the Top. Installation is easy, with the Setup program walking you through every step. Once you boot up BIAB, you'll need to select the MIDI driver and patch (sound)-selection options for your system. Sound and drum kit maps are provided for General MIDI, GS, and XG formats, as well as for many of the popular synths that have been on the market in recent years. Since BIAB's implementation of MIDI patch change/selection control is quite flexible, people who have unique or older synths will be able to take advantage of the best sounds available to them. Chances are you won't have to create a map for your particular synth or soundcard.

Chord Entry. BIAB can do a lot as an auto-accompaniment system, but it will not generate chord changes for you. Once you've entered the chords for your song, BIAB will take care of the rest. Chords are entered into a spread-sheet-style window by typing or playing them from a MIDI controller. Each measure contains two cells that can hold a maximum of one chord per quarter-note. For odd meters such as 5/4, the number of chords that can be entered into a cell is limited by the time signature. In a song with a time signature of 3/4, for example, the first cell holds two beats and the second cell holds only one. If you don't read music or just can't think of any chords to enter, you can take some from a piece of sheet music or a fake book.

Visit www.music-and-computers.com for a Band-in-a-Box tutorial.

I opted to play them in by typing Ctrl-Enter while holding a chord on my MIDI controller. This was a tremendous time-saver for me because I only had to concentrate on typing one keystroke instead of the many that I would have needed for some of the jazzier chords in my arrangements. One thing to consider if you choose to enter chords this way is that they need to be played in root position for BIAB to write the correct chord symbols. This might not matter to you if all you're doing is experimenting with chords. However, if you play a chord voicing of *B, D, F♯, G*, intending it to be an *Em9* right-hand voicing (where the root would be played by the bass), BIAB will notate this as a *GMaj7/B*, which won't do you any good if you plan to have your charts read by other musicians.

The list of chords BIAB "knows" is fairly complete, and should pose no limitations for most applications. Chords can

PHOTOGRAPH: PAUL HAGGARD

be entered or displayed in standard, Roman numeral, Nashville, or solfeggio notation (see Figure 1). If you're used to notating chord extensions as polychords, like "*D*/*F*7," you'll need to change your ways with BIAB. In the case of the previous example, you would type *F13♭9* instead. This is a more traditional and somewhat cumbersome way to notate chords, since the number of keys necessary to enter a chord is increased. The ability to create chord maps that would allow you to type chords the way *you* want is something I'd like to see added to the program.

You've Got Style. Years ago, BIAB started out with styles that made it popular among jazz musicians as a practice tool. Today, its styles range from funk to bluegrass to techno and everything in between. There are even third-party styles available (see "All the Fixin's" on page 61). Each style contains an A and B substyle, which are indicated by a part marker (A or B) at the beginning of a measure. The substyles correspond to the A and B sections commonly found in popular music, in which a song structure might be AABA. Substyles can control the musical intensity of a song. For example, if BIAB is playing a hi-hat pattern with a half-note bass line during an A substyle section, it might switch to ride cymbal and walking bass when it reaches a B substyle. In addition, BIAB will play drum fills that lead into any measure that contains a part marker, which means you can control where the fills will occur by strategically inserting markers in your song.

To pick a style for your accompaniment, you click on the STY button. The informative Select Style dialog box will appear. Here you'll find categories, complete names, musical descriptions, and examples for every style. When a style is loaded, its name appears above the chord sheet. After you press the space bar or click the Play button, the program pauses for a moment while it generates an accompaniment, then begins to play. One playback through an entire set of chords is called a *chorus*; choruses can be looped up to 40 times. A slightly different accompaniment will be created for each chorus. It's possible to assign a different style for each bar, which could yield some interesting results. I used this feature when I created an accompaniment for the Jobim tune "Desafinado," where the head was set to bossa nova and the bridge set to swing. This technique works very well for spicing up an arrangement.

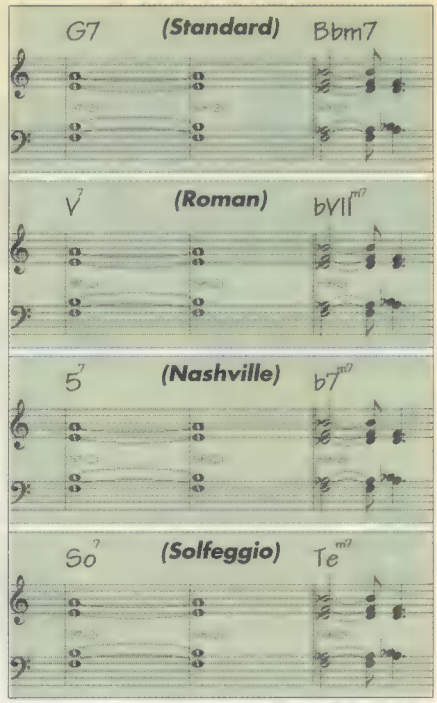

Fig. 1. *Band-in-a-Box can display chords in a number of ways. Here we see the same measure in four different display modes: standard, Roman numeral, Nashville, and solfeggio.*

So how do the styles sound? Some are incredibly realistic. Some, however, are not. Lackluster styles tend to be in the pop/rock vein, such as techno and heavy metal. There are two reasons for this: (1) This type of music tends to be tailored to specific sounds and performance techniques for instruments (like guitar) that can't be broken down into common denominators and used effectively in the MIDI accompaniments that BIAB creates. (2) The people who made these styles could have had a better understanding of what this music actually sounds like. (Maybe they just couldn't distinguish the subtle variations between heavy metal and thrash, but that's subjective anyway.)

Where BIAB shines is in styles that traditionally use more acoustic instruments —

DESCRIPTION
Auto-accompaniment/song construction software for Mac and Windows.

SYSTEM REQUIREMENTS
8 Mb RAM. System 6 or better (Mac); 486 or better (Windows 3.1 and 95). Soundcard or MIDI synth/module and MIDI interface.

FEATURES
Automatic generation of accompaniments, solos, and up to five-part harmonies based on a wide range of musical styles. Up to two melody tracks can be recorded. Lead-sheet notation with chord symbols and lyrics. Music and text font included. Accompaniment, harmony, and solo styles are programmable. Arrangements can be saved as MIDI files or copied to the MIDI clipboard.

COPY PROTECTION
None.

SUGGESTED RETAIL PRICES
Pro Edition: $88 (upgrade: $49); Ultra Edition (available on CD-ROM, includes 150 more styles than Pro Edition): $189 (upgrade: $89).

ACCESSORIES
Five Style disks ($29 each); two fakebook disks ($29 each); four Soloist disks ($29 each, or four solo disks plus bluegrass fakebook for $99). Two videotapes, Volume I (Basics) and II (Advanced), $29 each or $49 for both.

CONTACT
PG Music, 266 Elmwood Ave., Ste. 111, Buffalo, NY 14222; 800-268-6272 or 250-475-2874; fax: 250-658-8444; Web: www.pgmusic.com.

PROS
Realistic solos and accompaniments. Powerful tool for arranging, songwriting, and practicing.

CONS
Nonintuitive interface. Contemporary styles are less convincing. Requires a good deal of musical knowledge to take full advantage of features.

BOTTOM LINE
Once you get a handle on the awkward interface, this is a great program for practicing improvisation, printing quick lead sheets, and recording MIDI demos.

namely jazz, Latin, and country. In fact, after comparing two renditions of the Miles Davis tune "E.S.P." using a Bill Evans and Herbie Hancock style, multi-instrumentalist Ernie Rideout (an editor at *Keyboard*) commented that the realism of BIAB's accompaniments was "remarkable." The comping and soloing (more on this later) is exceptional for all of the acoustic categories. Whoever was involved in creating these styles, kudos to you.

If you don't like the way a style sounds, you can create your own with the Style Maker or adjust the instrument settings of the accompaniment. Styles comprise a minimum of one drum, bass, and piano (or similar harmonic instrument, such as organ) pattern; however, more patterns and instruments, like guitar and strings, can be added to a style. Three types of patterns — A and B substyle, as well as ending — can be recorded for all instruments in a style. Drum patterns, or loops, are limited in length to one bar and must be programmed in a grid dialog box. Harmonic instrument patterns vary in length from one to eight beats. You can record harmonic patterns, which can be played in with a MIDI input device or step-entered from the notation window. Patterns can also be imported from pre-existing styles, which means that you can combine patterns from all sorts of different styles to create your own blend of Caribbean and country, for example (if you dare).

Once a style has been applied to your song, you can make changes — which are separate from the edits made in the StyleMaker — to the various instruments of the accompaniment. In addition to setting volume, reverb, and chorus levels, you can slide tracks forward or backward relative to the beat. This lets you make bass parts play ahead of other instruments.

All the Fixin's

PG Music and third-party developers such as Norton Music sell additional Style, Soloist, and Song disks for Band-in-a-Box. These disks offer new and alternate versions of styles, along with more fakebook songs and soloist types. If you purchase any of the style disks, you might want to take advantage of *style aliases*. Here's how they work: Let's say you have a new style for swing called "Jump." You can create an alias so that when BIAB looks for a swing style, it will load "Jump" in place of the stock style included with the program.

Here's a quick list of add-on disks that are currently available (contact the manufacturer for detailed information): PG Music offers four Style, five Soloist, and two Fakebook disks, all $29 each. Norton Music (P.O. Box 13149, Ft. Pierce, FL 34979; 561-464-4609; fax: 561-467-2420) offers five Style and five Fakebook disks, $29 each. You can also find BIAB users offering additional styles on the Web. A good place to start looking is the Forum page on PG Music's Web site, www.pgmusic.com.

giving the impression of "driving" an ensemble, or make piano parts play behind, giving the impression that they're "laying back." BIAB also comes with a library of fakebook tunes, which are songs made popular by musicians as vehicles for improvisation.

A Cut Above the Rest. BIAB isn't the only auto-accompaniment system on the block. Soundtrek's Jammer (reviewed in the Sept/Oct '96 *M&C*) is a close competitor. Coda Music Technology's Vivace requires that you use factory-programmed songs, but it has the unique ability to follow tempo changes of a soloist. Voyetra's Jammin' Keys and Jump! Music's Song Factory, based on the discontinued Blue Ribbon SuperJam!, offer similar auto-accompaniment features. (We reviewed SuperJam! in our Summer '95 issue; the other two are reviewed in this issue.) What sets BIAB apart from the pack are its harmony and soloist capabilities. Main and counter melodies can be recorded using a MIDI controller or by tapping melody rhythms from a QWERTY keyboard. The result can be step-edited in the Notation window, which lets you change the pitch, velocity, and duration of each note. By having two melody tracks, you can create musical scenarios like "trading fours" (see "Band-in-a-Box Turbo Tips" at right).

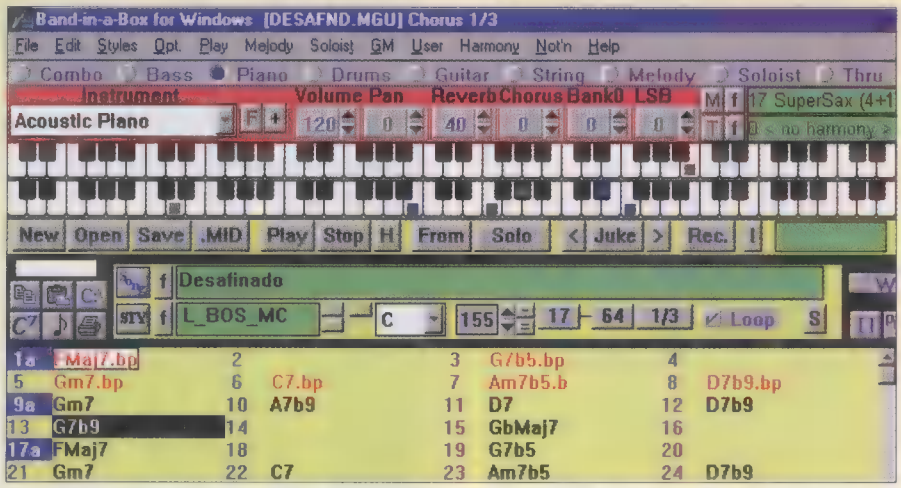

Fig. 2. *Thanks to two on-screen piano keyboards that light up the notes as you hear them, figuring out chord voicings is easy in Band-in-a-Box.*

Harmony. When you're done recording and editing your melody track, it's time to explore the possibilities of BIAB's harmony feature. BIAB's library of over 100 harmony types can be used to harmonize melody tracks. Two to five parts are available in a single harmony type, which includes voicings such as octave double, close position, Super Sax, and Drop 2 (see "Voicings 101" on page 64). Each harmony

voice can be mapped to one of three MIDI channels, which lets you create a more realistic section sound by assigning different horn sounds to each channel. Settings for octave doubling, octave dropping (when a note should be dropped down an octave based on instrument range), and velocity are provided for each of five available harmony voices. With these controls you can set your "lead player" voice to be louder than the rest of the "section," or your "second chair" voice to drop down an octave when notes are outside of a particular range.

Band-in-a-Box Turbo Tips

We've compiled these useful tips and tricks to help you get the most out of Band-in-a-Box. Take a look and try 'em out.

Practice Loops. While the accompaniment is playing in the Notation window, typing the "1" key will loop the four measures that were displayed when it was pressed. This passage can be sped up or slowed down using the "[" and "]" keys, and will be repeated indefinitely until you press the key again. Press the down arrow to advance to the next four bars.

Saving Changes. Any track in BIAB can be edited in the Notation window; however, only the changes made to melody and solo tracks will be retained when the song is played again. Since BIAB generates new accompaniment tracks every time a song is played, any changes you make to the accompaniment will be lost unless you save the song as a Standard MIDI File. The result can be imported back into BIAB as one of its melody tracks.

Count Off the Band. Use the minus (–) and equals (=) keys on your QWERTY keyboard to count off the "band." Pressing the minus key four times sets BIAB's tempo text box to the tempo of your taps. Tapping the equals key sets the tempo and starts song playback.

"Humanizing" Step-Entered Melodies. If you enter melodies in step time, you may notice that the result sounds a bit stiff. This is because the notes are entered precisely on the beat, and have exact durations. To help humanize a melody entered in this way, choose "Humanize Melody" from the Melody menu. This command adjusts the starting times, durations, and swing feel of the music to sound more like a real person played it into BIAB.

Trading 4's. You can generate a solo that "trades fours" with you by pressing the Solo button and choosing "Trade 4's" as the Solo mode in the Select Soloist dialog box. This generates a solo that plays for four bars, then rests for four, letting you solo. This is a great help to get out of a soloing rut, since it encourages you to listen and modify your solo according to what the BIAB soloist is playing.

From PC to Mac and Back Again. Style and song files are compatible between the two platforms without conversion. Save the files to a PC-formatted disk (Macs can read them using PC Exchange or Access PC), making sure to rename long file names to an eight-character name if you intend to load files into the PC version of BIAB.

Instant Vocal Harmonies. Harmonizers are effect boxes (audio processors, in other words) that will add new harmony notes to a sung melody. Some of these wonder boxes let you input chords from your MIDI controller, which the harmonizer will use to create harmonies. For example, if you play a major triad into a harmonizer while singing a note into it, your voice would be heard in harmony as a major triad. After saving a harmonized melody from BIAB (see the "Beyond the Box" link on the M&C Web site), play it back from your sequencer into a harmonizer box, such as Digitech's Vocalist, and sing along.

In addition to generating harmonies, BIAB can also create solos that imitate the melodic ideas and playing techniques of well-known improvisers. Names such as John Coltrane and Floyd Cramer appear as soloist types; if these names don't ring a bell, you can select from titles like "Blues–Jazz Guitar," "Country Swing–Piano," and "Big Band Brass." Soloist types are selected from a dialog box that includes a brief description of the solo style as well as settings for such parameters as phrase length, feel (straight or swing) and solo duration (in number of choruses).

A lot goes on behind the scenes to create convincing solos. In a nutshell, BIAB draws upon a vast library of idiomatic phrases that are pieced together according to musical scenarios within a song. For example, if your song is in the key of *C* (I) and you have a 4/4 measure of *Dm7* (ii7) for two beats followed by *G7* (V7) for two beats, BIAB looks at this ii-V scenario and picks a melodic phrase or pattern from its library that gets included in the solo. This is *way* cool stuff.

Because computers can't be made to think like human musicians (yet), the solos that BIAB generates don't always make the most sense melodically. This isn't a problem for someone who just needs to fill a 30-second radio spot, but after a few choruses, the lack of sensible development becomes apparent. You might be wondering, then, why anyone would want to use the soloist feature. By and large, the solos that BIAB generates are very realistic and incorporate a generous helping of the melodic ideas and patterns that you'll hear for each genre of music. Having this type of resource becomes very valuable to anyone interested in learning more about various styles of music.

What Are You Lookin' At? With everything that BIAB is capable of doing with your music, it would be a shame if you couldn't see the end result. Fortunately, there are a couple of options for your viewing pleasure. Two piano keyboards (see Figure 2 on page 62) located at the top of the screen light up to display what each instrument plays during the accompaniment (with the exception of drums). When you pause playback, the keys will stay lit, which is handy when you want to

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2	20	38	56	74	92	110	128	146	164	182	200	218	236
3	21	39	57	75	93	111	129	147	165	183	201	219	237
4	22	40	58	76	94	112	130	148	166	184	202	220	238
5	23	41	59	77	95	113	131	149	167	185	203	221	239
6	24	42	60	78	96	114	132	150	168	186	204	222	240
7	25	43	61	79	97	115	133	151	169	187	205	223	241
8	26	44	62	80	98	116	134	152	170	188	206	224	242
9	27	45	63	81	99	117	135	153	171	189	207	225	243
10	28	46	64	82	100	118	136	154	172	190	208	226	244
11	29	47	65	83	101	119	137	155	173	191	209	227	245
12	30	48	66	84	102	120	138	156	174	192	210	228	246
13	31	49	67	85	103	121	139	157	175	193	211	229	247
14	32	50	68	86	104	122	140	158	176	194	212	230	248
15	33	51	69	87	105	123	141	159	177	195	213	231	249
16	34	52	70	88	106	124	142	160	178	196	214	232	250
17	35	53	71	89	107	125	143	161	179	197	215	233	
18	36	54	72	90	108	126	144	162	180	198	216	234	

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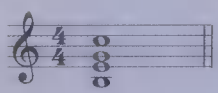
Voicings 101

If you've spent any time around synths, you've probably heard the term "voice." In that context, it usually refers to an oscillator — as in *64-voice* polyphony, which indicates the maximum number of notes the synth can play at once. In piano or horn section arrangements, the term means something entirely different. In this case, it can mean two things:

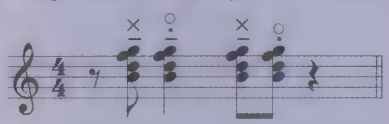
1. As a noun, "voice" refers to a single note within a chord — like the *C* of this *F* major triad:

2. As a verb it refers to the action of organizing the notes of a chord vertically (from top note to bottom note or vice-versa). This voicing of a *CMaj7* chord places the seventh on the bottom and the root on top (*B, E, G, C*):

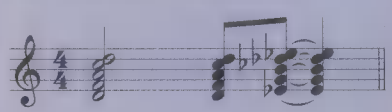


You can use BIAB's harmony feature to create and play harmonies (voicings) that are commonly found in many big-band, combo, and other instrumental ensemble arrangements. These voicings can be used to harmonize the melodies of your songs, letting you hear how they might sound if you had hired an arranger to arrange them. If you like what you hear, BIAB lets you print out separate lead sheets for each harmony voice so you can give the arrangements to real horn players. Here are a few examples of the voicings that come predefined with Band-in-a-Box:

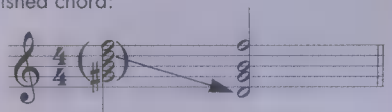
• *Close Position* voicings, like this *G7* chord, arrange notes within the span of an octave:



• This *Dm7* to *Eb7* passage uses a five-part voicing called "Super Sax," which doubles the lead alto note an octave lower:



• Dropping the second voice of a close-position voicing down an octave is known as a *Drop 2* voicing, which is used for this diminished chord:



check out a voicing that goes by too quickly.

Everything that BIAB generates can also be printed out as lead sheets. Notation options are bare-bones, but functional. You can enter a title, metronome marking, and copyright notice. Show/hide settings for notes and chords are also available. Layout options include the ability to print only the treble or bass staff and specify the number of staves per page. If creating professional lead sheets is your goal, you'll want to copy the MIDI information from BIAB to the MIDI clipboard or save it as a MIDI file, then bring it into a notation program for refining. (Stop by www.music-and-computers.com for an advanced tutorial.)

Sour Notes. My major criticism of BIAB is with its interface. For example, there's no Undo function. Nearly every other program on the market uses this common interface convention. I found myself reaching for the non-existent Undo command again and again. Furthermore, BIAB's main screen is filled with buttons that are uninformative, and in some cases not even labeled. Drum patterns are created in a grid dialog box, which is bad enough, but the grid only allows for one measure to be programmed at a time. These shortcomings make for a very nonintuitive interface.

Conclusions. Considering what BIAB is capable of creating, it's easy to think of many uses one would have for it. BIAB's accompaniments would be just as much at home in the practice space as they would on a Web page. The harmony feature is an incredible time-saver for band directors who need to whip up an arrangement for a student combo. Additionally, students get to hear what the arrangements sound like instantly, instead of having to wait until class. Anyone who creates commercial music will certainly welcome the ease with which lead sheets can be created.

There are competitors, like Soundtrek's Jammer, that offer similar functions with better interfaces, but BIAB is the only program I know of that can generate realistic solos. To program styles effectively, you will need a good understanding of music and the characteristics of the style you are working with. But the average person might not ever need to worry about this, since there are so many styles available, and more are being created by PG Music and third parties every year.

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Mysteries of MIDI

by Jim Aikin

System-Exclusive, Part 2: Real-World Uses

Until the direct brain-to-synthesizer link is perfected (not in our lifetime), some sort of electronic signals will be required in order to communicate with a synth. Lately I've been hearing rumors about FireWire, but even when those heady dreams of high-speed, broad-bandwidth data transfer become a reality in electronic music, the code flying down the wire will probably be some form of MIDI. That's why this particular column is so gol-dang important.

Most MIDI messages are pretty simple: A Note-On message starts a note, a Note-Off message stops the note. System-Exclusive messages, on the other hand, can be quite complex. As explained in the May/June installment of this column, a Sys-Ex data packet can be as long as the manufacturer of the synth chooses, and can do just about anything that the engineers who develop the instrument's operating system think might be important to musicians. Last time we explained the data format of Sys-Ex. Each model of synthesizer, you'll recall, has its own type of Sys-Ex message, which will be ignored by all other models. This month it's time to talk in more detail about what you might use it for.

Editor/Librarian Software. Maybe you do your own programming of new synthesizer sounds, or maybe you prefer to buy banks programmed by professional sound developers. (We're talking about creating sound *programs* here, also called *patches*. This is done using the edit parameters provided in the instrument. Creating *audio* sounds is a different topic entirely.) Unless your synth has its own disk drive, the best way to store and load sound programs is using your computer and an editor/librarian program. On the Mac, the best-known ed/lib program is Opcode's Galaxy; on the PC, it's Mark of the Unicorn's Unisyn. These are *universal* editor/librarians, which means that they each have a ton of different modules that are customized for working directly with different synthesizers. By cruising the Net, you can also find shareware editor/librarians that are designed specifically for one synth or another.

An editor/librarian communicates with a synthesizer using Sys-Ex data. The communications are usually two-way: The ed/lib can get the bank of patches currently stored in the synth's memory, so that they can be saved on your hard drive, and it can also transmit a new bank to the synth. To allow two-way communications, you need two MIDI cables. One cable runs from the synth's MIDI Out jack back to the MIDI In jack on the computer's MIDI interface; the other is the computer-out-to-synthesizer-in cable that you probably already use for sequencing (see Figure 1). If you have several MIDI instruments and want to use ed/lib software with all of them, your computer will need a MIDI interface with a corresponding number of MIDI inputs; using an editor/librarian is the main reason why you might need a multiport interface. (You don't actually *need* the big interface, however. I get along fine with a two-in interface and a long MIDI cable that I can snake around to the MIDI Out of whatever module I need the computer to receive data from. See Figure 2 on page 68 for another option.)

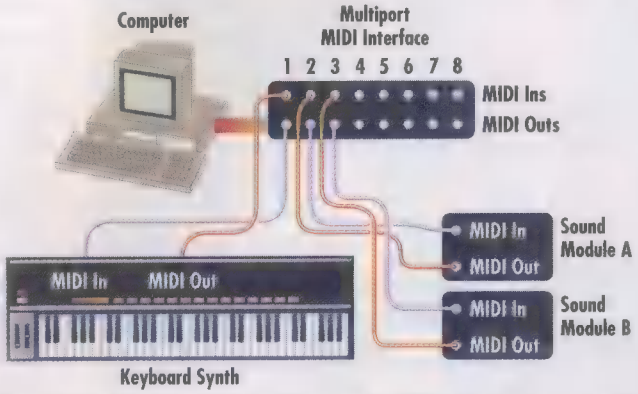


Fig. 1. *With a multiport MIDI interface, several MIDI devices can be connected to the computer bidirectionally. This is especially useful when you're using an editor/librarian program, because it enables each device to transmit Sys-Ex data back to the computer.*

To get the bank from the synth, the ed/lib will send a short Sys-Ex message called a *dump request*. The synth will respond by transmitting, or "dumping," its bank of patches over MIDI. (On a few first-generation MIDI synths, you had to initiate the dump from the front panel; no dump request message was defined.)

In order for the bank dump to occur as expected, the synth must be set to the proper *device ID*. This setting may be found somewhere in the instrument's "global" menu, or the current MIDI receive channel may do double-duty as a device ID. (Check the manual to learn how to set the device ID.) If the device ID that has been set in the instrument is different from the ID that the ed/lib software is using for that instrument, no data transfer will occur. If you happen to change the device ID on the instrument after storing a bank of patches in the ed/lib, you may not be able to load the same bank back into the instrument — and the error message may not tell you what the ID ought to be, so you're well advised to take a few notes when storing banks.

The device ID doesn't exist merely to make your life difficult: It's the solution to a potential problem. The problem is, what if you have two (or more) synthesizers of the same model in your MIDI/computer system? You may want to load each of them with its own set of sounds. In fact, this is quite likely; it's the main reason for wanting to have two identical units. If it weren't for the device ID, you'd have to physically unplug the MIDI In of one of the units while transferring data to the other one.

In addition to sending and receiving banks of patches, an ed/lib program can usually send or receive single patches (useful for assembling new banks from a library of existing patches). In edit mode, it can

TECHNICAL ILLUSTRATIONS: **RICK EBERLY**

adjust single parameters within your synth's sound-generating circuitry. For example, you could speed up the vibrato (by editing the LFO rate parameter) or make the sound punchier (by setting the envelope generators' attack times to zero). This is a terrific use of a computer to enhance your music-making: Generally speaking, the big screen of a computer is a vast improvement on the tiny LCD on the synthesizer's front panel.

A Sys-Ex packet containing a whole bank of patches can take a minute or more to send down the MIDI cable. Adjusting a single parameter, however, is much faster. The data packet may have as few as eight or ten bytes. You can adjust a parameter or two and then, without waiting, play a few notes on your MIDI keyboard to audition the result.

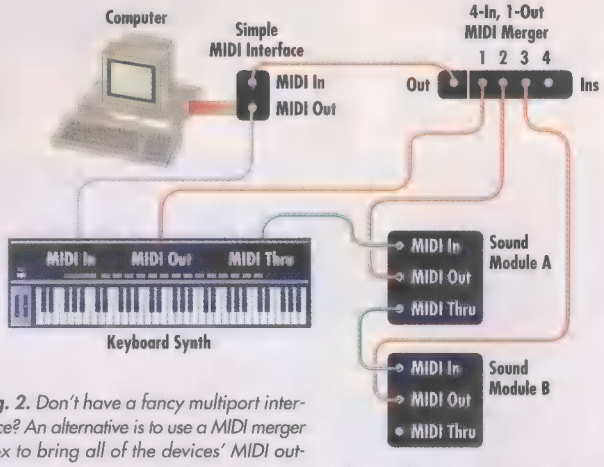


Fig. 2. Don't have a fancy multiport interface? An alternative is to use a MIDI merger box to bring all of the devices' MIDI outputs into the computer. When using a merger box in this way, it's important not to transmit MIDI messages from one device while another is in the midst of Sys-Ex communications. Sys-Ex data packets can be quite large, and the merger box might garble the data if it receives another input while it's handling the Sys-Ex.

This type of thing can be fun: Instead of being limited to a bank of preset patches, you can mutate the sound on the fly. If only you could record the mutations into your sequencer! Almost any synth could be ten times as expressive as before.

Depending on your sequencer, you may be able to do exactly that. Here's how:

Sys-Ex & the Single Sequencer. Let's say you want to open up the filter cutoff frequency while holding down a chord, giving the sound an expressive swell. But your synth won't allow you to assign a controller (such as the modulation wheel) to change the filter cutoff. You may be able to get the same musical result by recording a string of Sys-Ex messages into your sequencer along with the chord.

For this vision to become reality, three or four things have to happen. First, your synth has to have a Sys-Ex implementation that allows realtime control of the parameter(s) that you want to change. Most of them do — but "realtime" can mean one thing to an engineer and another to a musician. For the best musical results, the synthesizer needs to be able to change the parameter *while a note is sounding*. The Sys-Ex implementations on less expensive instruments may only be able to change the value of the parameter *between* notes, so that you'll hear the results on any following notes.

Second, your sequencer has to be capable of playing back Sys-Ex as part of the song playback. Many sequencers will do this, but a few older ones, such as previous versions of Cakewalk, handled Sys-Ex in a more limited form. Cakewalk provided a set of Sys-Ex *buffers* (memory areas) in which data could be stored. This type of system can be useful if you don't have an editor/librarian and want to use your sequencer for archiving banks of patches. In fact, any sequencer that can record Sys-Ex can be used for archiving banks of patches. You don't need a librarian at all unless you want to shuffle the patches around to create new banks. Sys-Ex buffers can also be used to transmit the correct patch to a synth at the start of a song, but they're not too useful for realtime parameter changes.

Over that hurdle? Now comes the fun part — getting the Sys-Ex into your sequencer. There are two methods. You can record it in real time (much the preferable method) or type it into the sequencer's event list numerically (only as a last resort).

Realtime Sys-Ex recording is pretty much like any other type of MIDI sequence recording, but it will only work if your synth is capable of transmitting realtime edits. Again, check the "global" area for a software switch called something like "Tx edits as SX." (Here "Tx" means "transmit," not "Texas.") When this parameter is switched on, each change that you make in a parameter using the synth's front panel will be transmitted to its MIDI Out jack as Sys-Ex data. All you have to do is make sure your sequencer is set to record Sys-Ex rather than filter it out, and then start recording. You'll probably find it easier to record the note data first and then do the Sys-Ex changes as overdubs.

Recording Sys-Ex into a sequence is useful for other things besides parameter edits. You might want to switch an old Korg M1 synth from single program mode to combi mode in the middle of a song, for instance. Many newer synths do this type of switching using the MIDI Bank Select command, but in the M1 a short Sys-Ex message is required. Fortunately, the M1 transmits this message each time you press the appropriate front panel button, so it can easily be recorded into the sequencer.

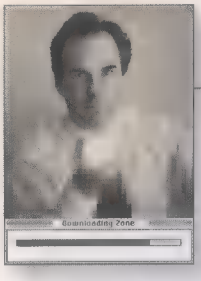
Even if your synth won't transmit front-panel parameter edits as Sys-Ex, it should still respond to incoming parameter changes in Sys-Ex format. To get the parameter changes happening, there are a couple of workarounds you can try. First, check to see whether your sequencer software allows Sys-Ex to be assigned to an on-screen slider. Check whether this slider has a "learn" mode. This feature causes the slider to "listen" to incoming MIDI and figure out what type of data you want to transmit. If your synth *will* transmit Sys-Ex parameter edits, you may be able to "teach" the message format to the slider, so that it can transmit (and record) Sys-Ex parameter changes.

No software sliders? There are other possibilities. If your ed/lib can run in conjunction with the sequencer, you may be able to record edits from the ed/lib directly into a sequence. (If you're using Galaxy and Vision on the Mac, for instance, they can communicate in real time via OMS.) If your software doesn't allow this, you may still be able to record the Sys-Ex output of the ed/lib into a keyboard workstation sequencer and then retransmit it from the workstation into your computer sequencer.

If all else fails, flip to the back of your synth's owner's manual and have fun dissecting the fine-print pages where the Sys-Ex implementation is documented. This information is usually cryptic in the extreme, but it's usually thorough and correct as well, because it's an engineering document. Nobody has bothered to pretty it up. If you're relentlessly logical and have the patience of a saint, you'll be rewarded (eventually) with gratifying filter swoops, LFO ramp-ups, waveshaping overdrive, breathtaking reverb depth changes, and anything else you can imagine.

Heck, if you can do all that, somebody might even hire you to write a column called Mysteries of MIDI.

Jim Aikin is the senior editor of Keyboard *magazine. His home MIDI studio has, at last count, 28 MIDI Out jacks.*



Downloading Zone

by John Poultney

Space Out Good

One good thing about the computer age is that the console at which you make your daily bread is oftimes the same one at which you can space out good.

Remember what spacing out used to be like? You'd stare at those things they used to sell at Radio Shack — the translucent plastic boxes that you'd hook up to a stereo and would respond to different musical frequencies by flashing colorful lights behind the plastic? The way the plastic was etched, the lights made these weird geometric patterns. No? Well, what about lava lamps, then?

Moreover, remember when utilizing such devices actually seemed like a good idea?

Well, this month I'm happy to report that your computer can transport you back to those halcyon days of yesteryear. Merely download any of the following programs and you'll be staring blankly into space in no time. You should probably put your computer on a timer for these, lest daybreak find you still sitting there motionless, seeing, nay, feeling the music as it spills from the speakers of your standard multimedia-ready computer.

Sounder. *Garçon!* Go and fetch me Sounder, by Jack Feudenheim. It's at www.sounder.com. The title of this program is innocuous enough, but believe you me, ten minutes or so after starting up this welterweight Windows gem (only 538Kb!), you'll be on another plane.

Not to dwell on the subject, but the author describes Sounder as "a musical lava lamp." And in many ways it is just that — a pleasant, flowing thing that sits there on your desktop. In the program's windows float mysterious and brightly colored 3D objects that twirl and spin as though in outer space. All the while, mysterious, ethereal sounds come sparkling from your speakers. (See Figure 1 on page 70.)

Turns out that the 3D objects (cubes, spheres, tetras, balls, and the mysterious "rune rocks" for you J.R.R. Tolkien fans) are what Feudenheim calls "Soundimations." Sounder is controlled by the properties you assign to these objects; sounds are generated according to the movement of the Soundimations though the windows. You can tell the objects what instruments to play (all 16 MIDI channels are available, so people with lots of time on their hands can assign different Soundimations to various external tone generators), what note ranges to play, and the duration of the notes. Ambitious types can even design their own animations by combining a series of bitmap (.BMP) files into a "filmstrip" animation. The Web site has a library of downloadable Soundimations, Jack tells me, that are made by others for the purpose of sharing. Try it out and you'll probably come up with a few that are worth showing off. I had two windows open, with three objects in each. One window was assigned to taiko drums (General MIDI program #117) and the other to "warm pad" (program #90). Somebody stop me!

Ten minutes after starting up Sounder, you'll be on another plane.

Jack said he created Sounder because of his appreciation for ambient music, which is characterized by patterns that change subtly over time, creating a soothing, hypnotic feel. "What struck me was that this kind of music is limited when distributed as hard copy on a compact disc or cassette," he said. "It seems [better] suited to be software-based, so that a piece's content need never be the same twice, and its length [can be] open-ended." The rise of PCs equipped with General MIDI soundcards lent credence to this idea, and Sounder was born.

Indeed, since Sounder's files are essentially MIDI commands, you can pack in a lot in a small file. Jack tells me a file that will play for ten hours uses only 800 bytes! Sounder does require a decent system,

ILLUSTRATION: BEN FISHMAN

however — a 486SX/25 or higher with at least 8Mb of RAM and a Sound Blaster 16, though you'll get much better results with later wavetable cards.

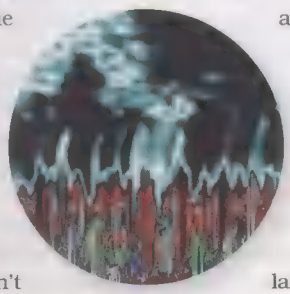
Sounder will make you glad you have a PC. Get it now from the aforementioned address, or alternatively through MidiFarm (800-324-6254 or www.midifarm.com/sounder). The demo version online is save-disabled; the full version will set you back a mere $20 — a pittance for the modern proletariat, no?

Just in case you're one of the unlucky few with no Web access, you can order a copy through snail mail from Perpetual Music Inc., 401 E. 74th St., #3E, New York, NY 10021. You can even call the author at 212-535-8760. Order via e-mail at orders@sounder.com.

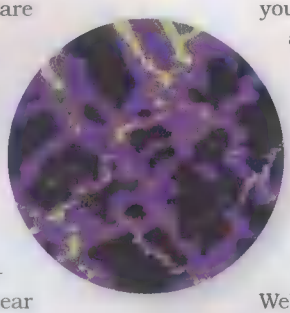
Fig. 1. *As you watch mesmerized, Sounder (PC) twirls animated 3D objects across your screen, creating ambient MIDI music in sync with their movements.*

The Many Moods of Cthugha. I don't want you people out there to get the wrong idea about me, but I enjoy varied literature. Some years back, I read some of the short stories of H.P. Lovecraft, the happy fellow who created Herbert West, Re-Animator.

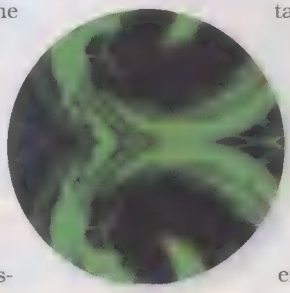
H.P., as his friends no doubt called him, wrote cheery little stories like "The Terrible Old Man," "The Crawling Chaos," "Winged Death," and everyone's campfire favorite, "The Thing in the Doorstep."



Needless to say, reading such work can lead a fellow to spacing out as well, but in a different way. I mean, read this guy's stuff and you can't sleep. So the way I figure it, you might as well stay up and stare at your computer screen.



In one of H.P.'s stories, namely "The Call of Cthulhu," there's a character called Cthugha (pronounced "kah-thoo-gah"). Dig this passage: "Cthugha resembles an enormous burning mass continually varying in shape. It dwells at or near the star Fomalhaut, from whence it may be called. It is one of the most obscure and remote of all the Great Old Ones."



Mmmmm . . . scary. Well, thanks to Australian programmer Kevin Burfitt, Cthugha (who, by the way, is accompanied by "fire vampires" wherever he goes, H.P. notes) is now a cross-platform application that does nothing more than sit there on your screen creating the weirdest patterns you've ever seen. The cool thing is, Cthugha does its thing to music. You have to have some music going into the program to get the displays.

To see what I mean, hitch a ride over to www.afn.org:80/~cthugha/ and download yourself a copy.

In one of the more egalitarian displays of charity I've seen on the Net, there are versions for DOS, Windows, Mac, and Linux (a free version of Unix) — and they're all free!

All you have to do is launch Cthugha, start an audio CD in your CD-ROM drive, and your screen does indeed become a swirling mass of lights that continually vary in shape, color, and luminance, until, like the astronaut Dave at the end of *2001*, you want to say, "My God — it's full of stars!" (See the three examples at left.)

Just how cool is Cthugha? Well, Jeff Mercer, keeper of the Cthugha home page, originally contacted the author to establish a Cthugha site and spread the word because he considers it to be "one of the coolest programs in the world, hands down." What I like is that you don't have to do anything to enjoy it — probably the simplest yet most entertaining thing I've seen. I checked it out on a Power Mac 8100, playing Morris Tepper's *Big Enough to Disappear* CD (www.rit.edu/~jcs1589/candlebone/tepper.html), and I was just plain mesmerized.

Of course, there's a slight cost for all this mesmerization. If you're using a Mac, you'll need a PowerPC-based one. For PCs, you'll need a soundcard (any flavor of Sound Blaster-compatible will do, as long as it supports sound input — you can also hook a stereo or a microphone to the card and experiment). The program doesn't yet work on Windows 95, but the author is reportedly working on — get this — Cthugha 97, which will let you space out on that platform.

The Cthugha home page also has links to an abundance of similar programs, mostly for DOS or Windows, that will perform similar pyrotechnic feats. And while I don't make any preferential statements towards literature or dance-related entertainment, I'm told that these programs are popular at raves. In fact, if you really want to space out, you might want to hook a video projector to your system and display the patterns in truly large format.

And wouldn't you know it — one of Cthugha's cousins (AcidWarp, for DOS and Windows, available at www.noah.org/acidwarp/) contains instructions on constructing just such a contraption.

So stop just sitting there, and start spacing out.

John Poultney is a San Francisco-based technology writer/editor who occasionally entertains as "bassist" in the Human Torches (see www.actionpacked.com). Known aliases include 74131.3235@compuserve.com and jpoult7734@aol.com.

by Ken Johnson

Music for Video

The best movie on education I ever saw was called *A Thirst for Learning*. It was a '50s French film with English subtitles about a headmaster who was hired by a small town filled with sullen and unmotivated kids. The hero of the story, the headmaster, succeeds in making enthusiastic learners out of his students because he invests lots of time learning about the world from their point of view. He then carefully crafts his lessons so that the subject matter is presented in the context of the students' lives.

How can we apply this idea to our own music programs? One way is to approach music from a film scoring, or composing, perspective. It's no secret that television and film are major influences in our students' lives. With recent developments in software and hardware, composing music and sound for video is a real option for educators.

The idea of producing original music and sound for a video is enticing to almost everyone, and your students will find it irresistible. We're not talking about feature-length movies, mind you, but shorter scenes and snippets that can be easily manipulated by desktop computers. Here are some concepts that your students can learn by examining music for film that will ultimately make them better musicians.

Keep the Focus. An important concept in composition is *focus*. What is the most important idea at any given time? In a video, it's usually the action, images, or dialog on the screen. Making students aware of these things when they are scoring should result in music that supports the video instead of distracting from it. Later, when the student is no longer composing for video, she should still be asking herself, "What is the most important idea at this point, and how am I supporting it?"

How's the Economy? Related to focus is the idea of economy: the use of a minimum number of musical ideas and instruments to complement the situation. If there is too much competition for the viewer's attention, the main point of the video is lost.

Can You Take a Cue? When you watch a movie, notice where musical entrances ("cues") occur. These entrances may or may not correspond to points of action or dialog on the screen. If you hit every available cue with a corresponding musical event (or sound effect), the results can be cartoonish. Is that the effect that's called for in a particular movie clip, or is it more effective to show some restraint and only highlight the most important cues? Or to make an entrance before an obvious cue to add foreshadowing? An awareness of entrances in this situation will heighten your students' awareness of entrances in other compositional situations.

Make the Necessary Arrangements. With the large palette of sounds available in MIDI keyboards and computer soundcards, it can be tempting for your students to over-indulge. Seeing and hearing the results of their orchestrations in a video, however, highlights whether their choices are effective or not. What is the emotional tone of a video clip? Does a given instrumentation support or detract from the tone? Did the composer choose traditional, acoustic instrument sounds or synthesized and electronic sounds? What was the rationale for the choices? Answering these questions for a video is a nice intermediate step to being able to make similar choices for a stand-alone composition.

Perhaps the most productive way to learn from these projects is to show and discuss them in class. You'll find that the debate over whether the music for a video clip "works" or doesn't work will elicit a response from almost everyone. Make sure you have some videos to illustrate points as they come up in discussion. Any of the films from the *Star Wars* trilogy, for example, can illustrate all of the above points exceedingly well. Remember

ILLUSTRATION: JOHN UELAND

to use examples from films that your students will be interested in.

On the Technology. Professionals use a wide assortment of gear and synchronization devices when composing music for picture. The fact that this hardware is somewhat complex and expensive eliminates these methods from common school use. But there are a number of music software programs on the market that can bring us basic movie playback capabilities at a minimum cost.

The technology I have the most direct experience with is Apple's QuickTime movie format, an appealing standard for users in education since its files are compatible with both Macintosh and Windows machines. The QuickTime application is free. Mac users with System 7 already have it. Updated versions and the Windows QuickTime Movie Player can be downloaded from Apple's Web site.

QuickTime is *not* state-of-the-art video technology. For one thing, the movement of images may appear somewhat jerky. This is because QuickTime movies are typically only 15 frames per second, which helps to keep the file sizes down. (When we watch a video, we're used to watching around 30 frames per second.) Secondly, QuickTime movies are usually displayed in a small window. But what we may be losing in quality, we gain in three areas that are so important when adopting technology for instructional purposes: price, accessibility, and simplicity. You can find QuickTime movies on the Internet at www.quickTime.apple.com/sam/#mov. (See my column in the May/June '97 *M&C* for more places to find QuickTime movies.) If you use existing movies, you need to be aware of the copyright restrictions. Most in-class educational uses, especially of short clips, should fall under the "fair use" doctrine, so even if you make a number of copies for students, you shouldn't have any problems. However, be sure your students understand that they can't upload the clips (with their new soundtracks) to Web sites. Also, copyrighted material would be a poor choice if a talented student wanted to enter her work in a competition or show it outside the school without written permission. Some copyright owners won't allow their material to be used for any purpose, while others don't mind if you use their work so long as you aren't making money by doing so.

If you really want to open up the possibilities, you and your students can digitize your own movies from a VCR. Older "AV" and many newer Macintoshes have video input jacks that allow you to import video. Most Windows and some Macintosh machines will need third-party video digitizing cards to add this capability. On the software side, the two most common applications I know of for capturing video are Avid Video Shop and Adobe Premiere. In addition to converting the video to a QuickTime movie, these programs offer extensive video-editing capabilities. Now we're ready for the fun stuff.

Several MIDI sequencers let you import digital audio and QuickTime movies, which can be synchronized with your MIDI tracks. This means that the movie and the music created in the sequencer are "locked" together so that a given spot in the music will always happen at an exact spot in the movie and vice-versa (see Figure 1). The soundtrack you create can then be saved and exported as the soundtrack of a new movie, giving you a finished product that can be played by any QuickTime movie player. Since all of this happens within a single program, it's very straightforward and easy to pull off, making it well suited for teaching situations. Opcode, Emagic, Cakewalk, Steinberg, and Mark of the Unicorn all have products with these capabilities.

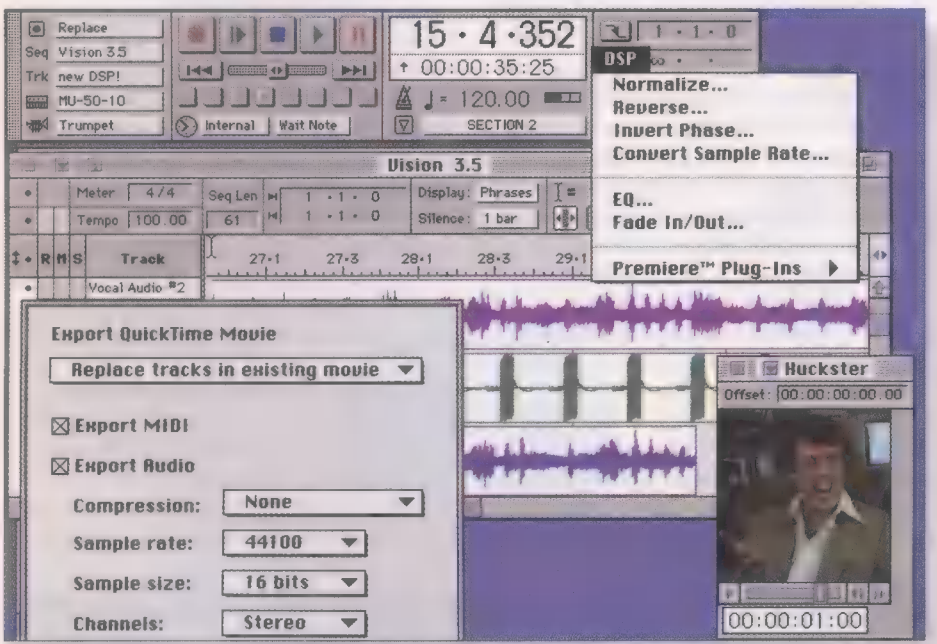


Fig. 1. *Some MIDI sequencers, such as Opcode's Vision, allow you to synchronize a QuickTime movie to a MIDI sequence by simply opening the movie from the application's file menu. If the movie contains a soundtrack, it will be imported as a regular digital audio track. You can add or edit MIDI and audio tracks as usual. The resulting file can then be exported as a new QuickTime movie complete with soundtrack.*

Fade Out. There's something to be said for putting yourself on an equal footing with your students once in a while. The vast majority of us, in our training as musicians, learned nothing about writing music for picture. This is a great opportunity for us to step out of our traditional role as the great repository of knowledge and into a role as a guide, mentor, and fellow learner. We can demonstrate how to learn and how to pursue new skills. Many teachers who have tried these activities are astounded and inspired by the resourcefulness and instincts their students show in this area.

This is by no means an exhaustive overview of the issues, products, and technologies available for teaching music for picture. The point is that with a recent model Macintosh or Wintel machine and a basic knowledge of the software involved, you can open up new worlds to your students — and to yourself. We'll get a little more perspective on the subject next issue when we talk to some educators who have been teaching music for picture.

Ken Johnson has been a music educator for 15 years. He's currently the educational sales manager for Opcode Systems. Please send your ideas on computer-enhanced music education to him at kenj@opcode.com or call 847-540-7372. He'll share the best ideas in upcoming columns.

MOD Philes

by Eric Bell

Hail Bop!

"Hail Bop!" might have been the cry of '50s jazzers, but today it's spelled "Hale-Bopp," and the comet of that name is now receding from our solar system. Many nights my wife and I have wandered out onto the Doghouse Deck and peered skyward to see that amazing beacon of frozen light as it spins past our terrestrial home. It's been an awesome sight from where we live, partly because there's very little light pollution.

Our theme this time out isn't astronomical, or even horoscopical. Yes, we've been spiritually touched by Hale-Bopp, and apparently it's had an effect on some of our tracker friends out there. But now the comet is missing from our world, and similarly, the pieces covered below have some major compositional elements missing. Yet they achieve internal balance in some other way.

Dan Cowan (who hasn't provided a catchy "handle," so we'll call him Orbit) sent in a FastTracker-format composition called simply "The Comet." He says it was inspired by the visit of that same 25-mile-in-diameter frozen ball of ice and gas.

Orbit has mixed up a special melange of samples, including some filter sweeps, resonant lead sounds, reverbed bass drums, and vocal breath noises. These tones were carefully combined to produce a tonal landscape (or spacescape). Overall, this spawned a very atypical MOD composition: One might describe the result as an "ambient" or "atmosphere" piece.

One of the things you'll notice about "The Comet" is that there isn't a rhythm track *per se* — no pulsating drum beats or percolating Latin grooves, no cha-cha-cha. Instead, "The Comet" relies on pure atmosphere derived from sound. There is a very understated harmonic progression in the piece, although this is not the major part of the musical information. Any harmonies are nicely clouded over by the qualities of the samples used.

Not a toe-tapper, this one, but "The Comet" clearly and effectively takes the listener on a journey, which in this case happens to be through the solar system and beyond. Check out "The Comet" on the MOD Philes Web site and see how it uses sound to transform time and place.

Many of you have asked, "How can I learn to create MOD files?"

One thing about Orbit's tune bothered me — overall I felt buoyed by the sounds and loose harmonic structure, yet the end of the piece simply chopped off dead, as if the comet had encountered a black hole. It's as important to end as it is to begin, folks. Writing a strong and appropriate conclusion to a piece is as crucial as finding the right melodic hook. "The Comet" suffers because of this abrupt ending.

D.J. JiFFy submitted "JuNGLE PhUNK," a MOD in the ever-popular jungle style, which emphasizes percussion and bass. What's intriguing about this piece is that a huge part of the sonic palette is missing — the middle frequencies. "JuNGLE PhUNK" is mostly highs and lows with nothing occupying the in-between, and it's the in-between where the melody is usually placed to carry a piece. Does it work? Strangely, "JuNGLE PhUNK" strikes its own balance without any melody line, using just the extreme ranges of pitch for most of its harmonic and rhythmic substance.

"JuNGLE PhUNK" starts out with some very deep bass tones (the kind boom-car drivers love), accented by a very high-pitched hi-hat riff. Slowly this builds, and as the song progresses, it becomes clear that all the harmonic content is in the deep bass. (There *are* some midrange sounds that are panned from side to side as effects, but they're accent, not substance.)

D.J. JiFFy created the bass tones from scratch and modified his drum

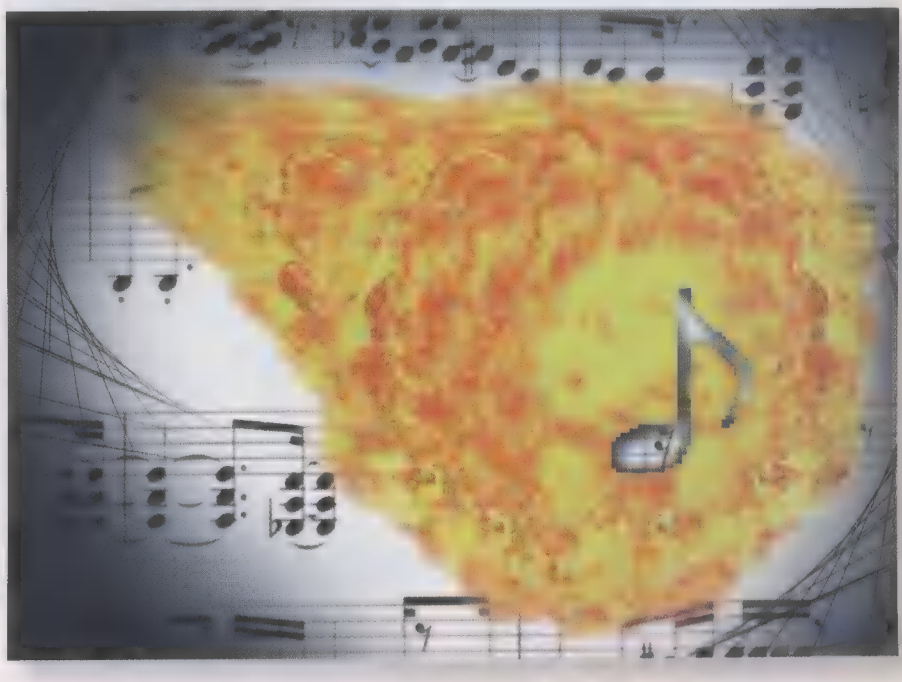


ILLUSTRATION: SMART DESIGN

tones to suit this high/low split. In his own words (and capitals), "I Created All the BASS tones in Cool Edit, using the 'Create Tones' [function], Then Added SLight CrossFades To the Beginning And End Of Each BASS Tone, Thus Eliminating 'POPS.' Programming the Drums was/is Crazy. The Drums Are From An 808 [vintage Roland drum machine] Except I Raised The Pitches and Speeds." (D.J. apparently has a short circuit in his Caps Lock key.)

Altogether, JuNGLE PhUNK works, even though there is no melody other than what's happening in the bass line. D.J. isn't afraid to limit himself and make the bass and high drums work for him. I liked the panning and pitch slides he used on the super-low bass sounds and tried to locate the tracker effect command that made the bass slide away in pattern 19, but I couldn't find it.

Under the Scope. I loaded up FastTracker to take a closer look at the song, and found that D.J. had used a rather large (237Kb) sample of a bass that included the elusive drop in pitch. It might have been better (certainly more efficient) to use tracker effects for pitch slide on an existing sample rather than bulk up the file with this large slide-bass sound.

Using Cubic Player, I then took a look at the frequencies being emitted by "JuNGLE PhUNK" (see Figure 1). The oscilloscope view shows the very low-frequency waves (bottom) accompanied by high-frequency cymbal information (upper right).

Incidentally, Cool Edit is a PC-based shareware sound-editing program. It's been around for quite a while, and a lot of trackers use it to tweak samples. As D.J. JiFFy mentions, Cool Edit can generate tones right into a .WAV file. This is a great way to create your own bass tones. You can also add effects such as reverb, delay, echo, flanging, and distortion with the registered version. Contact Syntrillium Software (P.O. Box 62255, Phoenix, AZ 85082-2255; 602-941-4327) for ordering info, or download it free from www.syntrillium.com/index.htm.

How to MOD. Many of you have e-mailed and asked me, "How can I learn to create MOD files?" But I haven't been able to give a decent, concise answer because many of the tools are so tricky to learn and tracking can be very complex. Now there's help in the form of an excellent history lesson and tutorial. Check out *The Zen of Tracking* by J. Rice at falcon.invincible.com/~jerm/newcomers.html.

Eric Bell is the Top Dog of Howling Dog Systems, makers of Power Chords and other music software. He is not a frozen ball of gas and ice, spinning aimlessly through space.

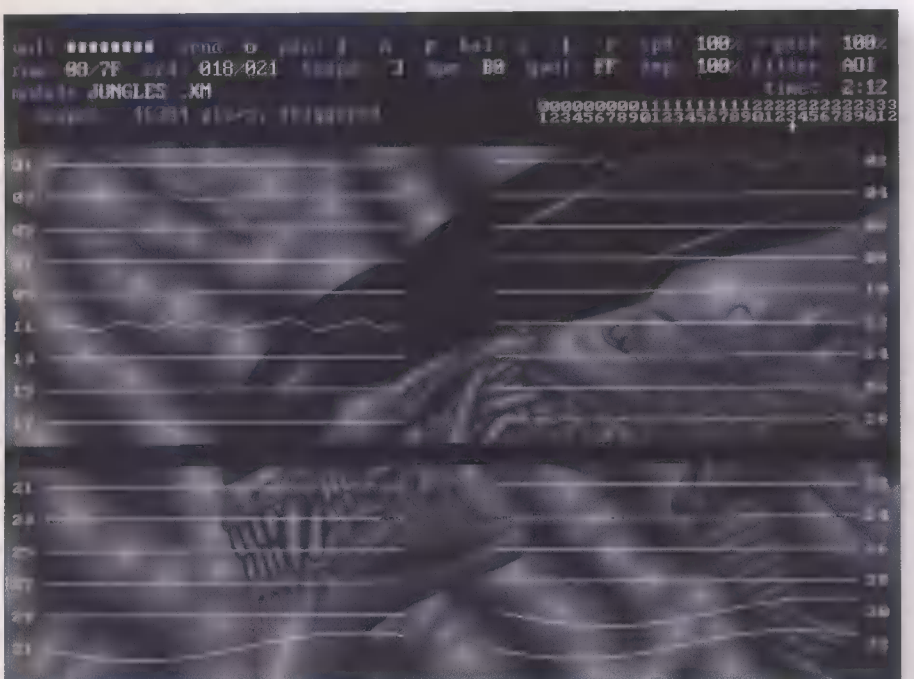


Fig. 1. *Oscilloscope view of "JuNGLE PhUNK" in Cubic Player. Note the very low frequencies in tracks 30–32 and the very high frequencies in tracks 2, 3, and 18. There are almost no middle frequencies. You can download Cubic Player from www.hamburg.roses.de/~ham00622/cubic/english/index.html.*

MOD Philes Online

You can reach the MOD Philes Web site and have your say in our new Usenet newsgroup by visiting:

www.howlingdog.com,
www.midifarm.com, or
www.music-and-computers.com.

There you'll find the tunes we write about, tools to play and compose MODs, other readers' feedback, and lots more.

To submit your original MOD tunes, just log on and follow the instructions. If your composition is selected for coverage in this column, you'll receive one of a number of fine prizes. These include **Midiman's MultiMixer 6** mixer (visit them at www.midifarm.com/midiman), **Sonic Foundry's Sound Forge XP** audio editing software for Windows (see www.sfoundry.com), and **Schatztruhe's *MODs Anthology*** CD-ROM of 18,000 MOD files (see www.schatztruhe.de or www.ninemoons.com).

MOD Philes Bit Bucket

The Trackering (TT) is an interesting competition that's run every two weeks. At 7:00 P.M. EST on the first and third Saturday of each month, a sample pack is released. All contestants must use the set of sounds included in that pack to create an original track by the next weekend. Everybody who submits a track votes for their favorite composition. There are others who act simply as judges.

You can get more information on this innovative contest by checking out tt_rules.txt from ftp://ftp.cdrom.com/pub/demos/incoming/music/tt/. To subscribe the Trackering mailing list, send a message to axelsson@freenet.hut.fi with the subject "Subscribe TT."

If you're interested in checking out some of the results of previous Trackering competitions, you can download entries from ftp://ftp.cdrom.com/pub/demos/music/contests/tt/.

by Scott Garrigus

For more soundcard resources, visit www.music-and-computers.com/Links

MORE ON THE WEB

How Do I Choose the Right Soundcard? (Part 2)

With so many different soundcards on the market and the multitude of features available, it's a wonder we can ever find a suitable solution to our sonic needs. Most people just settle with the soundcard that comes installed on their PC. But what if you want something better? In the last issue, I gave an overview of soundcards, focusing on the synthesizer features. This time we're going to dig a bit deeper and discuss what you need to know when choosing a new card.

Different Strokes. Soundcards are available in three basic configurations. The most common is the *audio-plus-synthesizer* version, which contains both a MIDI synth and the circuitry to record and play back digital audio. Examples include the Creative Labs Sound Blaster 16 and the Ensoniq Soundscape.

The *sampling* soundcard is generally more flexible. Unlike the basic soundcard (which only provides a pre-determined, ROM-based set of sounds), this type lets you create your own personalized sound set by storing short audio files (samples) in the card's RAM memory. Like ROM-based sounds, these samples can be played back and altered in real time with effects such as vibrato. TerraTec's EWS 64 card fits in this second category, as does AVM's Apex, although the Apex includes both sample RAM and ROM.

Finally, there's the *audio interface*. These are typically high-end products optimized for recording digital audio to the computer's hard drive, and may support multiple channels of audio. Some examples are the Antex StudioCard and the Creamware MasterPort.

Connecting a soundcard to a computer is done by plugging the card into a slot. Today's PCs contain two main types of slots: ISA (Industry Standard Architecture — older and slower) and PCI (Peripheral Component Interconnect — newer and faster). A third type of slot, called PC Card or PCMCIA (Personal Computer Memory Card International Association), is usually only found on portable computers, and soundcards in this format are still rare. [*Ed. Note: E-mu Systems has just announced one. See the Cutting Edge section in this issue.*]

ISA slots can take up to 40% of the computer's processing power, while PCI slots take up about a tenth of that. PCI-based soundcards can also transfer data much faster than an ISA-based card and in turn provide much better performance. Most soundcards are still ISA format, but the industry is slowly moving toward PCI. The main drawback with PCI audio cards is that DOS-based programs (like most games) don't talk to them. However, some PCI cards, like Diamond's Monster Sound, are designed to co-exist with ISA or motherboard audio circuitry. And VLSI has just announced a chip called the SongBird that provides ISA compatibility.

Soundcard prices range from $19 to over $1,000; more money buys you more features and better sound quality. (Although virtually every card touts "CD quality" audio, that just means it supports a 16-bit/44.1kHz data format, which is like saying a Yugo has Ferrari quality because it has four wheels. We'll discuss the really important specs below.) For $99 you can grab yourself a basic soundcard that's decent for everyday audio needs. Move into the $200 range and you can get yourself a nice wavetable-synthesis card with amateur sampling capabilities. Climb to the $500+ range and you're looking at a quality digital audio recording card that you can use to create your own CDs.

Digital Audio. Soundcards typically provide two line-level audio inputs (for

ILLUSTRATION: DENNIS IRWIN

stereo), two line-level outputs, and one or two microphone-level inputs. The line-level connectors are used to transfer sound from cassette decks, electronic keyboards, or other standard audio devices. Since microphones generate a very low audio level, the mic input is sent through a preamplifier on the soundcard. Some soundcards also provide amplified speaker outputs, but you'll almost always get better audio quality by using the line-level I/O, because the onboard amplifiers are usually a cheap consumer convenience and can easily pick up the considerable electrical noise inside the computer.

Some high-end soundcards also offer digital audio inputs and outputs. These special connectors let you attach the soundcard directly to compatible devices such as some CD players and DAT decks. Using these connections gives you the best possible sound, because analog/digital conversion is handled away from the noisy computer. Speaking of connections, the 1/8" Walkman-style jacks you'll find on low-cost soundcards are not as reliable as 1/4", RCA, or XLR jacks.

Even though you may be able to plug multiple devices into a soundcard, most cards internally mix all of their audio sources down to one stereo signal during recording and playback. Pricier cards support software that lets you record each device separately on its own discrete track, which lets you edit and process the audio more easily. Look for a card with *full-duplex* capability, which means it can play back tracks while simultaneously recording new ones.

As mentioned above, almost all soundcards support a 16-bit resolution and 44.1kHz sampling rate for audio recording and playback. The reason some cards sound better than others is due to the quality of the electronics. Not surprisingly, more money buys higher-quality components and designs. Two measurements that help describe the differences are *signal-to-noise ratio* and *frequency response*.

The signal-to-noise ratio tells you how loud the signal is compared to the amount of internal noise made by the soundcard. The bigger the number, the quieter the card. An SNR of 85dB is a worthy target. Frequency response is actually a range of numbers. The frequency response of human hearing is approximately 20Hz to 20kHz. A good soundcard will encompass at least that range, but most important, it will be *flat*, meaning the recorded audio level at all frequencies will vary very little (say, ±1dB) from the original signal. This spec is often "ignored" by marketers.

Soundcard Features Checklist

Here's a summary of the most desirable features to look for when shopping for a soundcard. Remember to check with the soundcard manufacturer to see if your computer system is compatible. And if you plan to use third-party software, be sure to ask that manufacturer which cards they recommend.

Synthesizer Specs

- √ General MIDI (GM) compatibility. (Additional GS or XG compatibility is better.)
- √ 24-note polyphony (more is better).
- √ At least 2Mb of wavetable ROM or RAM (more is better; RAM is also highly desirable).
- √ Effects processing (the more effects sends, the better; realtime control is useful).
- √ Programmable sounds.
- √ Resonant filter.
- √ Fat Seal (certifies consistent GM playback).
- √ MPU-401-compatible MIDI interface in hardware.
- √ Daughterboard upgradeability.

Digital Audio Specs

- √ 16-bit (or greater) resolution.
- √ 44.1kHz sampling rate (additional rates are helpful).
- √ Full-duplex recording and playback (the more channels, the better).
- √ 20Hz–20kHz frequency response, with as little deviation (the "±XdB" spec) as possible.
- √ 85dB (or greater) signal-to-noise ratio.

Connectors

- √ The more, the better.
- √ Avoid 1/8" miniphone jacks if possible. Get 1/4", RCA, or (best of all) a breakout box/cable or digital interface.
- √ For high-end setups, get balanced connectors. Word clock and SMPTE support are also recommended.

FX. Another desirable feature is real-time signal-processing effects, which can add an air of professionalism to any mix. Look for these on both the digital audio and the synth. The most common effects include *chorus* (a detuning effect that makes the original audio sound bigger and richer), *delay* (which produces multiple echoes of the original sound), and *reverb* (short for reverberation, this produces a dense collection of echoes that are so close together they create a wash of sound, simulating environments like concert halls and large rooms). 3D processing is also becoming available. Unlike the cheeseball "hyper-stereo" effects of the past, *positional* 3D creates the illusion of sound that seems to expand beyond the speakers. Better systems even let you place the sound behind or below the listener. Some soundcards provide multiple speaker outputs to heighten the effect.

Look for systems with multiple *effects sends*, which will let you apply different amounts of processing to different tracks or synth parts.

Synth Stuff. We covered this at length in the last column, but I should mention one extra feature that's especially handy: resonant filtering. This gives additional tone color possibilities. [*Ed. Note: If you plan to use General MIDI, visit www.fatman.com/bstchce.htm for a list of recommended soundcards. The Fat Man has tested dozens of cards and awarded the Fat Seal to the ones with consistent GM playback.*]

Software. If two cards are very similar in the hardware department, you may find that the bundled software tips the balance. Sometimes these programs will be scaled-down versions of commercial programs, sometimes they'll be junk, and sometimes they'll be full-on professional programs designed specifically for the card. The most common applications are audio recorders and editors, MIDI sequencers, synthesizer patch editors, and mixers.

Audio editors let you view and manipulate the digital audio waveforms using your mouse, creating fades and snipping out unwanted clicks, for example. Sound Forge XP from Sonic Foundry is a good name to look for in this category.

MIDI sequencers are used to play, record, and edit the instructions that tell a synthesizer what notes to play and how to play them. Cakewalk Apprentice is one of the better MIDI sequencer bundles.

Mixer software provides you with on-screen volume sliders for each of the available sound sources. The better programs include mute buttons, solo (a button that lets you turn off all the audio sources except the one you're soloing), and pan (a slider that lets you position the sound source within the stereo field from left to right).

Off to the Store. You should now have a good understanding about what soundcards are and what they do, as well as what to look for. But before you run off to the store to spend your hard-earned cash, be sure to consider more subjective factors like wavetable sound quality, ease of installation, and technical support. It's a good idea to talk with other people who are already using the card(s) you're considering. Stop by *M&C*'s Web site for tips on how to find them.

Scott Garrigus may soon be searching for a new soundcard himself — right after he empties his inbox (garrigus@pan.com), revamps his Web site (www.pan.com/garrigus/), and feeds his cat, Figaro.

Continued from page 80

API, a programmer can write software plug-ins that enhance the host program. With a universal API, a program that worked on a variety of operating systems could be written.

4. 3D and surround-sound capabilities. This, along with point #6 below, would go a long way toward making computer-based music more, well, music-like.

5. High-speed, wide bandwidth connections. I talked about increasing bandwidth in the May/June '97 *M&C*. Once that big hose is in place, the possibilities for interactivity (see point #2) will be enormous.

6. Six channels of audio output at high (44 to 88kHz) sampling rates and high (16 to 24-bit) resolution. One of the things we learned at Bar-B-Q is that you can beef the heck out of the number of bits you're using, you can beef your sampling rate way up, but once you pass 16-bit/44.1kHz, it's very hard to hear the difference. However, as you add channels of sound (and speakers), you continue to get noticeable improvements in audio realism.

7. Per-channel effects capabilities. Being able to apply independent signal-processing effects to each sound moves us ever closer to the Record Plant on the desktop.

8. Programmatically controlled, fully extensible synthesis and voice processing. The idea here is that we don't want our instruments to be limited to FM, or wavetable, or whatever. Voice processing, which would enable a computer and multiple users to communicate verbally, is also a crucial component of interactivity.

Dig In. Valuable information can be obtained from the brief list of features in the sidebar. It says that hardware-wise, we're very close to a solution. And since a certain amount of agreement grew up around that list, it's conceivable that it could be established as a standard. Are these literally the specs that will end up on everybody's desktop in the next year or five years? I don't think anyone can say. But the fact that this group of experts agreed to them starts a huge machine in motion.

The Interactive Audio Special Interest Group (IASIG) of the MIDI Manufacturers Association is continuing to refine these ideas. There are people at high levels of big companies talking about this stuff. But I want to say very strongly that I *don't* think somebody can grab a piece of this list, take it off into a lab, build the thing before anybody else does, and force the standard on everyone. Sound standards are too complicated and fragile for companies to continue swashbuckling like that. They might find themselves out of step with the times, and that would serve to perpetuate the incompatibility issues that will add three or four more little rosin sculptures to my desktop and make me really mad.

The fact that the BBQ Box is a hefty enough computer to do anything anyone had thought of, and yet obtainable enough that a company would consider putting it together and selling it, has a giant implication. Another way to say that is this: *It doesn't take much to give a musician everything he or she wants.* Which makes you think — why don't we have everything we want right now?

The Fat Man, George Alistair Sanger, is internationally known as the biggest name in music for interactive entertainment. Together with Team Fat, his gang of cowboy composers, he has contributed the musical scores for over 100 software products. To read the complete Bar-B-Q document, visit www.music-and-computers.com/Links.

Websites

MIDI on the Internet! Access product information, sequences, and demos from leading vendors and composers via the Internet. FTP or WWW to midi.assist.com today. Data Assist, Inc., 651 Lakeview Plaza, Suite G, Columbus, OH 43085. (614) 888-8088.

Software

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BBQ: The Details at Last

In the nightmare that is multimedia, a lot of us are getting caught in our underwear in front of a very large classroom.

It is much harder than it should be to get good audio out of computers. What can be done about that? Well, for the past several issues, I've been talking about Project Bar-B-Q, the think tank organized last autumn by Team Fat and attended by 35 of the top minds in the computer audio industry. Bar-B-Q was convened to answer the question, "What do we want to see in hardware and software for music on computers in the next five years?"

Here — at last — are the answers.

Before we dive into the technical specs, I should share three important conclusions of Bar-B-Q:

• It would be very helpful to educate consumers, marketing people, manufacturers, game developers, and musicians about the benefits of quality sound playback in multimedia applications.

• A computer platform with the features defined by the Special Roundtable (see sidebar) would be able to run any "killer app" for sound that the Bar-B-Q Group could come up with.

• Apple's QuickTime seems to contain a great deal of the functionality that would be required of a standardized language for creating and playing back interactive music.

The Envelope, Please. And now, the eight features the Bar-B-Q group decided will be important in the musical computer of 2001, listed roughly in order of popularity. It's interesting to note that the items dealing with compatibility fall near the top of the list, while the "toys" fall toward the bottom.

1. Compatible and easy-to-use applications, development tools, and household entertainment products. Right there, I would bloody well have two or three more days a week to do my work.

I've spent the better part of this week dealing with soundcard issues. Right now my desk is covered with these infernal green rosin sculptures that remind me of one of the more obnoxious puzzles from *The 7th Guest* — it seems they'll only work in random combinations. I have seven soundcards on my desk, and I have to put them into my computer as the task at hand dictates, painstakingly deinstalling everything that I'm not using at a given moment.

Some spectacular application ideas were thrown around at Bar-B-Q. I think a totally self-contained Record-Plant-on-a-desktop would be a killer app: Imagine a fully functional recording studio in a computer. (A computer that had a piece of Scotch tape run all the way around it so that no one could pry it open and stick some doggone green card in it that could stop it from working.)

We're basically asking for true plug and play: Turn it on, plug something into something else, and begin your adventure of entertainment or creation. Pull the ripcord and start mowing.

2. Interactive composition and playback standards. Do you realize what's implied in that? That is the birth of an art form. Imagine a musical Web page that let two people in different places interact with each other and the music, creating a new piece. If this language existed, you could write a file like that, ship it to anyone in the world, and they'd be able to play it back or hook up to you and play it with you. People at home would be able to compose environments — not just MIDI files, but BBQ files.

I may be vastly over-simplifying what's involved in this. On the other hand, I see Todor Fay's Microsoft Interactive Music Architecture crawling right up to the border of what we're talking about. And I see Thomas Dolby's Headspace Beatnik Editor just on the border of being considered a standard language for interactive music. If QuickTime is an opportunity to really incorporate the widest span of everything everybody would want to do in an interactive file, that's the birth of something big! I don't know what the relative merits of these and other systems are, but we're going to get whichever one(s) we pick, so we need to do it with open eyes.

3. Universal, open application programming interfaces (APIs). Basically, APIs give programmers access to the inner functions of a program or operating system. If a program has an open

Continued on page 77

I Want It Now!

In a special roundtable at the conclusion of Project Bar-B-Q, the hardware designers asked the software designers and musicians what features they would need to create and play back a "killer app," a program that could conclusively demonstrate the power and importance of high-quality computer audio. It turned out that they didn't need much — such a computer could be built today. Currently, the IASIG's Platform Development Working Group is looking into building a "BBQ Box" as a proof of concept. Here's what the musicians wanted:

- 44.1kHz, 16-bit PCM digital audio recording and playback.
- 32-stream digital audio playback (mixed to 6 channels).
- 6 speaker outputs.
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- 44.1kHz, 24-voice DLS (downloadable sample support, *i.e.*, the ability to load new samples into RAM and play them like ROM-based synthesizer sounds).
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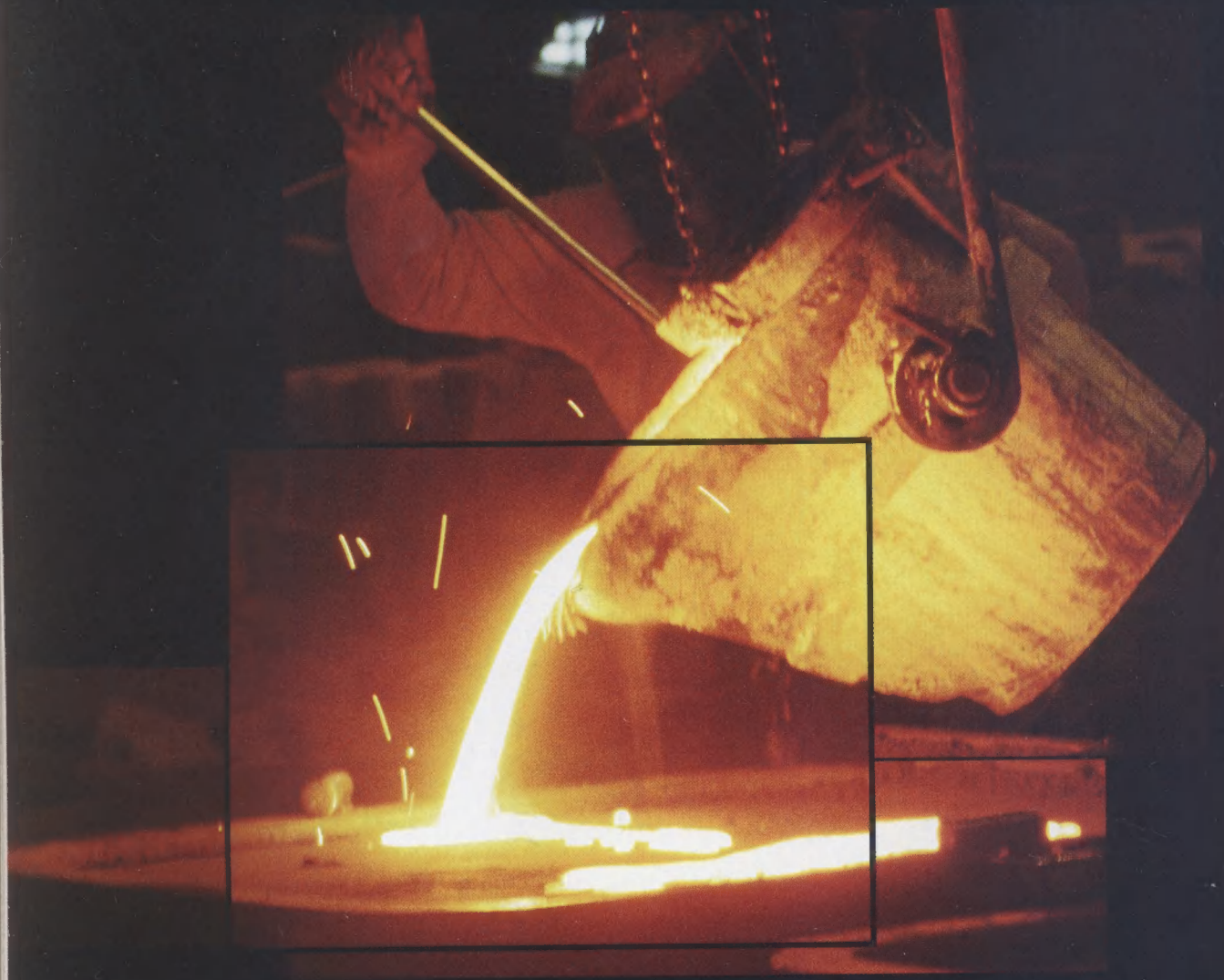

Sound Forge 4.0, the award-winning digital sound editor for Windows, now supports ActiveMovie audio plug-ins. Sonic Foundry has selected ActiveMovie (a component of Microsoft's Interactive Media technology) as the foundation for the Sound Forge plug-in architecture. ActiveMovie plug-ins will be supported by a variety of audio software companies including Sonic Foundry and Waves.

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